DOCUMENT RESUME

ED 424 131 SO 028 433

AUTHOR Morton, John S.
TITLE Advanced Placement Economics. Microeconomics: Student Activities.
INSTITUTION National Council on Economic Education, New York, NY.
ISBN ISBN-1-56183-477-7
PUB DATE 1996-00-00
NOTE 230p.; For the teacher resource manual and the macroeconomics student activities, see SO 028 432-434.
AVAILABLE FROM National Council on Economic Education, 1140 Avenue of the Americas, New York, NY 10036, Tel: 212-730-7007 ($19.95).
PUB TYPE Guides - Classroom - Learner (051)
EDRS PRICE EDRS Price MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS *Advanced Placement; Capitalism; Decision Making; Economic Change; Economic Climate; *Economics; *Economics Education; Free Enterprise System; High Schools; Instructional Materials; *Investment; *Microeconomics; Social Studies

ABSTRACT

This book is designed to help advanced placement students better understand microeconomic concepts through various activities. The book contains 5 units with 73 activities, sample multiple-choice questions, sample short essay questions, and sample long essay questions. The units are entitled: (1) "The Basic Economic Problem"; (2) "The Nature and Functions of Markets"; (3) "The Theory of the Firm"; (4) "Factor Markets"; and (5) "The Role of Government." (EH)

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ADVANCED PLACEMENT ECONOMICS

MICROECONOMICS: STUDENT ACTIVITIES

John S. Morton

ED 424 131

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ADVANCED PLACEMENT ECONOMICS

MICROECONOMICS: STUDENT ACTIVITIES

John S. Morton

EconomicsAmerica
National Council on
Economic Education
A partnership of education, business, and labor

Author

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ISBN 1-56183-477-7

5 4 3 2 1

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Microeconomics

Unit 1
The Basic Economic Problem

Key Ideas

- Scarcity exists because we have limited resources and unlimited wants. No society has ever had enough resources to produce all the goods and services its members wanted.
- Goods and services are produced from productive resources. These resources—land, labor, capital, and entrepreneurship—are limited.
- Scarcity requires people to make choices. If we use scarce resources for one purpose, we cannot use them for another.
- Opportunity cost is the forgone benefit of the next best alternative when resources are used for one purpose rather than another.
- Because of scarcity, every decision has an opportunity cost.
- Economic costs take account of the opportunity cost of doing one thing rather than another. Economic costs include explicit costs, which are paid directly, and implicit costs, which are not paid directly. Both implicit and explicit costs are opportunity costs.
- Using free goods does not involve opportunity cost because free goods are available in unlimited quantities.
- Economics is concerned with marginal decision making. In economics, "making decisions at the margin" is very important. Marginal choices involve the effects of additions and subtractions from the current situation.
- A production possibilities curve can be used to illustrate scarcity, choices, and opportunity cost diagrammatically.
- The slope of a production possibilities curve shows the opportunity cost of producing another unit of one good in terms of the amount of the other good that must be given up in order to produce the additional good.
- Because resources are scarce, using them efficiently allows us to get the most from them. Efficiency is increased through specialization and trade. Economists use the concepts of absolute and comparative advantage to explain why trade takes place between countries and between individuals. These concepts are based on differences in the opportunity costs of producing goods and services in different areas or by different individuals.
- Because of scarcity, people and societies use economic systems to determine what to produce, how to produce, and for whom to produce.
- Throughout history, nations have used tradition, command, and market systems to allocate resources.
- The law of comparative advantage shows how everyone gains through trade.
- Economic theory is useful in analyzing and understanding the world around us.
- The test of an economic theory is its ability to predict the future consequences of economic actions.
- The broad social goals of a society influence decisions about how best to use resources.

ACTIVITY 1

Do You Think Like an Economist?

Circle T for *true* or F for *false* in the statements that follow.

T F 1. Because it is desirable, sunshine is scarce.

T F 2. Because it is limited, polio is scarce.

T F 3. Children are scarce mainly because their parents spend money on them for food, shelter, education, and other things.

T F 4. The main cost of going to college is tuition, room, and board.

T F 5. If mass transportation fares are raised, almost everyone will take the trains anyway.

T F 6. The more useful the good, the higher its price.

T F 7. If someone makes an economic gain, someone else loses.

T F 8. If one nation produces everything better than another nation, there is no economic reason for those two nations to trade.

T F 9. A nonregulated monopoly charges the highest possible price.

T F 10. Most businesses don't care about consumers; they just want higher profits.

Exercise developed by John Morton.

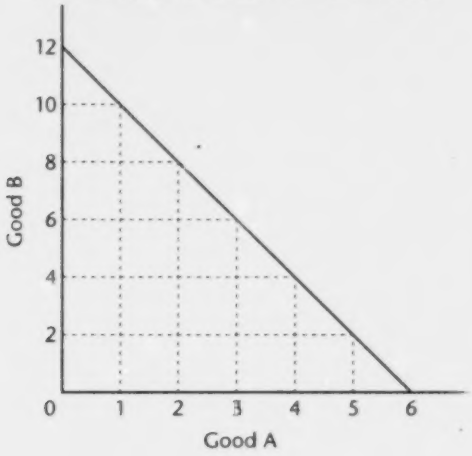
ACTIVITY 2

Scarcity, Opportunity Cost, and Production Possibilities Curves

Scarcity necessitates choice. More of one thing means less of something else. The opportunity cost of using scarce resources for one thing instead of something else is often represented in graphical form as a production possibilities curve.

Part A.
Use *Production Possibilities Curves 1-3* to answer questions a, b, c, and d for each curve. Write a number on the answer blank or cross out the incorrect words in parentheses. (Note that *Production Possibilities Curve 3* is not realistic, but it serves to support a "what if" thought exercise.)

Production Possibilities Curve 1



1. If this economy is presently producing 12 units of Good B and 0 units of Good A:

   a. the opportunity cost of increasing production of Good A from 0 units to 1 unit is the loss of _____ unit(s) of Good B.

   b. the opportunity cost of increasing production of Good A from 1 unit to 2 units is the loss of _____ unit(s) of Good B.

   c. the opportunity cost of increasing production of Good A from 2 units to 3 units is the loss of _____ unit(s) of Good B.

   d. This is an example of *(constant/increasing/decreasing/zero)* opportunity cost per unit for Good A.

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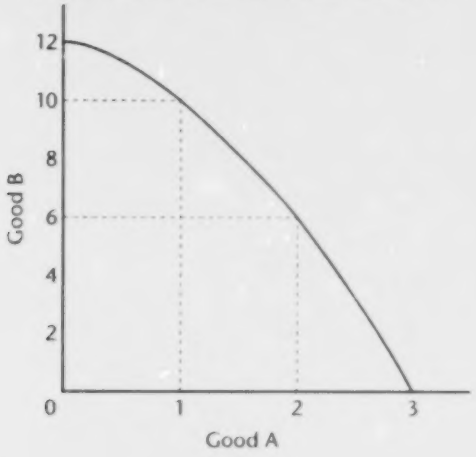
ACTIVITY 2 continued

Production Possibilities Curve 2



2. If the economy represented in *Production Possibilities Curve 2* is presently producing 12 units of Good B and 0 units of Good A:

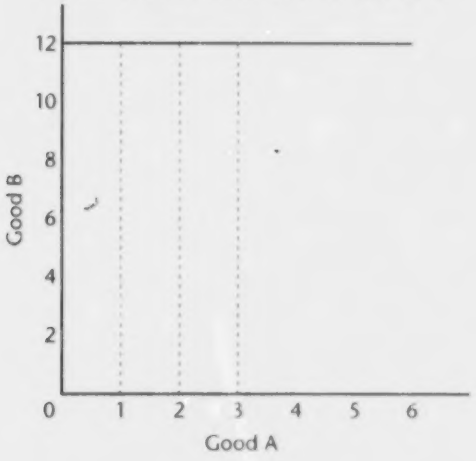
   a. the opportunity cost of increasing production of Good A from 0 units to 1 unit is the loss of _____ unit(s) of Good B.

   b. the opportunity cost of increasing production of Good A from 1 unit to 2 units is the loss of _____ unit(s) of Good B.

   c. the opportunity cost of increasing production of Good A from 2 units to 3 units is the loss of _____ unit(s) of Good B.

   d. This is an example of *(constant/increasing/decreasing/zero)* opportunity cost per unit for Good A.

Production Possibilities Curve 3



ACTIVITY 2 continued

3. If the economy represented in *Production Possibilities Curve 3* is presently producing 12 units of Good B and 0 units of Good A:

   a. the opportunity cost of increasing production of Good A from 0 units to 1 unit is the loss of _____ unit(s) of Good B.

   b. the opportunity cost of increasing production of Good A from 1 unit to 2 units is the loss of _____ unit(s) of Good B.

   c. the opportunity cost of increasing production of Good A from 2 units to 3 units is the loss of _____ unit(s) of Good B.

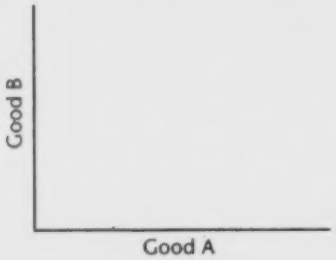
   d. This is an example of *(constant/increasing/decreasing/zero)* opportunity cost per unit for Good A.

Part B.
Use the following axes for *Production Possibilities Curves 4, 5,* and *6* to draw in the type of curve that illustrates the labels given below each axis.

Production Possibilities Curve 4

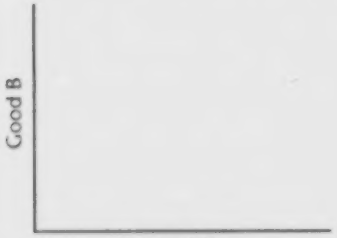
Increasing Opportunity
Cost per unit of Good B

Production Possibilities Curve 5



Zero Opportunity
Cost per unit of Good B
(Good B is a free good)

Production Possibilities Curve 6

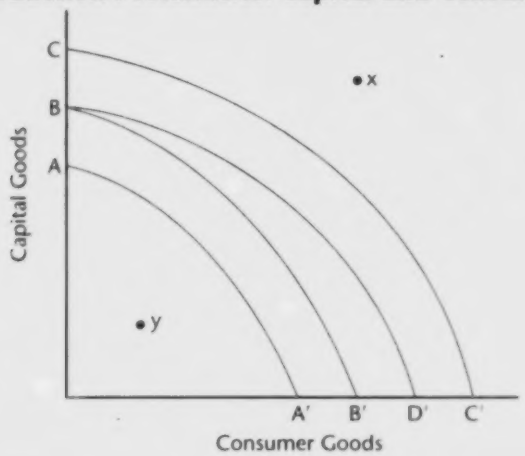


Constant Opportunity
Cost per unit of Good B

ACTIVITY 2 continued

Part C.
Use the following production possibilities diagram to answer each of the questions that follow. Each question starts with curve BB' as a country's production possibilities curve.

Production Possibilities: Capital and Consumer Goods



1. Suppose there is a major technological breakthrough in the consumer goods industry, and the new technology is widely adopted. Which curve in the diagram would represent the new production possibilities curve? (Indicate the curve you choose with two letters.) _____

2. Suppose that a new government that forbids the use of automated machinery and modern production techniques in all industries comes into power. Which curve in the diagram would represent the new production possibilities curve? (Indicate the curve you choose with two letters.) _____

3. Suppose massive new sources of oil and coal are found within the economy, and there are major technological innovations in both sectors of the economy. Which curve in the diagram would represent the new production possibilities curve? (Indicate the curve you choose with two letters.) _____

4. If BB' represents a country's current production possibilities frontier, what can you say about a point like x? (Write a brief statement.)

5. If BB' represents a country's current production possibilities frontier, what can you say about a point like y? (Write a brief statement.)

ACTIVITY 3

Scarcity, Opportunity Cost, Values, and Choice

Unfortunately for you, both your mathematics and economics teachers have decided to give tests two days from now. (Remember, this is a fictitious example.) You have pondered the problem and realize that you can spend a *total of 9 hours* studying for *both* exams. Your real problem is to decide how to allocate your 9 hours (scarce resource) in studying for both exams (competing goals).

After some deep thought, you construct the following tables to guide you in this decision. These tables tell you what score you expect to get in each course, given the number of hours you might spend studying for each exam.

Economics: Study and Score

Number of Hours Studied	Expected Score
0	0
1	26
2	48
3	61
4	73
5	83
6	91
7	97
8	100

Mathematics: Study and Score

Number of Hours Studied	Expected Score
0	0
1	24
2	44
3	62
4	75
5	84
6	91
7	96
8	100

Part A.
The first problem is to decide what values you attach to the courses.

1. If economics has the highest priority, i.e., you want to get 100 on the economics exam, what will your score on the mathematics test be? _____

2. If mathematics has the highest priority, i.e., you want to get 100 on the mathematics exam, what will your score on the economics test be? _____

3. Now suppose the minimum passing grade is 50 in each subject.

   a. An **implicit** cost of getting 100 on the economics exam is to *(pass/fail)* mathematics. (Cross out one.)

   b. An **implicit** cost of getting 100 on the mathematics exam is to *(pass/fail)* economics. (Cross out one.)

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ACTIVITY 3 continued

Part B.
Suppose now that instead of trying for 100 in one course, you want to get the highest possible combined score, using the 9 hours you have available for studying.

1. One way to proceed is to compare all different 9-hour combinations. To do this, complete the following table by filling in all of the blank spaces.

Combinations of Economics and Mathematics Study

Total Hours		Scores		
Economics	Mathematics	Economics	Mathematics	Combined Score
8	1	100	24	124
7	2	97	44	141
___	3	___	62	___
___	4	___	75	___
___	5	___	84	___
___	6	___	91	___
___	7	___	96	___
1	___	26	___	___

What is the "best" allocation of study hours in terms of attaining the highest combined score? _____ hours economics and _____ hours mathematics

2. An alternative method of finding the "best" allocation of study hours is to do what economists call *working at the margin*. In order to utilize this method we must go back to our original tables and add a third column to each one as is done below. These columns, labeled "marginal increase" in the table, give the *change* in the expected score which will results from a one-hour *change* in study time spent upon each particular course.

Marginal Increase of Mathematics and Economics Study

ECONOMICS			MATHEMATICS		
Hours	Scores	Marginal Increase	Hours	Scores	Marginal Increase
0	0		0	0	
		26			24
1	26		1	24	
		22			20
2	48		2	44	
		13			18
3	61		3	62	
		12			13
4	73		4	75	
		10			9
5	83		5	84	
		8			7
6	91		6	91	
		6			5
7	97		7	96	
		3			4
8	100		8	100	

ACTIVITY 3 continued

You now proceed by asking: "Where should I use each additional (marginal) hour?" The answer is: "Where it will do the most for increasing my combined score." For example, the first hour of study can be allocated to economics or mathematics. If it is allocated to economics, your total score will increase by 26; if it is allocated to mathematics, your total score will increase by 24. Hence, it is best to allocate hour number 1 to economics. The second hour can either increase your economics score by 22 or your mathematics score by 24—give it to mathematics. Complete all of the appropriate blanks in the table below to record your results. Remember that as you allocate an additional hour to mathematics or economics you move down one row in the corresponding table above.

Allocation of Time to Economics and Mathematics Study

Hour Number	Allocate to Economics	Allocate to Mathematics	Marginal Increase	Total Score
1	X	___	26	26
2	___	X	24	50
3	___	___	___	___
4	___	___	___	___
5	___	X	18	___
6	___	___	___	___
7	___	___	___	136
8	___	___	12	___
9	___	___	___	___

Total hours: Economics: _____ Total Scores: _____
Mathematics: _____

Explain why these answers agree with your answers in part B1 above.

Indicate the hour(s) at which it makes no difference to allocate an additional hour of study to economics or mathematics.

ACTIVITY 3 continued

Part C.
Now you have figured out three alternative ways to allocate your time **1:** 8 economics, 1 mathematics; **2:** 1 economics, 8 mathematics; **3:** 5 economics, 4 mathematics. Assuming that these three alternatives are the only ones you consider:

a. the opportunity cost of selecting alternative **1** would be the loss of alternative _____ or alternative _____ depending on which of these alternatives you prefer.

b. the opportunity cost of selecting alternative **2** would be the loss of alternative _____ or alternative _____ depending on which of these alternatives you prefer.

c. the opportunity cost of selecting alternative **3** would be the loss of alternative _____ or alternative _____ depending on which of these alternatives you prefer.

The choice you make depends on your values and priorities. The alternative you select should be the one you value most. In order words, this means you should select the alternative with the *(highest/lowest)* opportunity cost as the "best" alternative. (Cross out one.)

Which alternative will you choose? Why? What is its opportunity cost for you?

Part D.
Food for Thought

The preceding analysis may seem very artificial to you. To see the "real world" meaning of this exercise, change things so...

- Rather than 9 hours, you have $9 billion to allocate.
- Rather than exams, you must choose between two programs: social security payments (economics) and defense needs (mathematics).
- Rather than test scores, you have some measure of society's total welfare.
- Rather than being a student, you are a Member of Congress.

Look over your allocation of study hours from the Table *Allocation of Time to Economics and Mathematics Study* as though they were billions of dollars. Would you change anything? Why or why not?

ACTIVITY 4

The Cost of College Education

The economic costs of a choice can vary depending on which group is considered. Differences in these costs can cause differences in opinion about the desirability of various economic policies. For example, place yourself in the position of a person who contemplates going to college and living in a dormitory. Your job is to figure out how much it will cost you and others for you to attend college for one nine-month school year, i.e., the cost of a student-year. The following figures are presented to you. (Use only these figures, realistic or unrealistic as they may be.) Consider these data carefully; then answer the questions below in the space provided.

a. Tuition: $2,400/student-year.
b. Textbooks and school supplies: $900/student-year.
c. Faculty and administrative salaries and other university expenses budgeted by the Board of Trustees from a fund provided by the state legislature: $2,200/student-year.
d. Contributions to the university from alumni, private foundations, and other sources: $600/student-year.
e. You can normally work and earn $800/month when you aren't going to school. But now, except for the summer, you go to school full-time and cannot work for nine months of the year.
f. You receive a scholarship of $500/year from the Board of Trustees from funds provided by the state legislature.
g. It costs $200/month to live at home.
h. Dormitory fees are $400/month.

1. a. How much would it cost *you*, as a student, to attend college for a nine-month school year? Indicate the components of your cost. (You may want to review the list of Key Ideas for Unit 1.)

b. How much would it cost *state taxpayers* to send you to college for this time? Indicate the cost components. (Note that any money provided by the state legislature is a cost to taxpayers.)

c. How much would it cost *society* to send you to college for this time? Indicate the cost components. (Note that the idea of "society" here is everyone who makes a contribution to paying for the student-year, e.g., you the student (or parents), taxpayers, and others who may be involved.)

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ACTIVITY 4 continued

2. Suppose the state legislature decides that it is no longer desirable to devote so many public resources to education. Thus, (1) tuition increases by $300 to **$2,700** per student-year; (2) salaries and other university expenses budgeted by the Board of Trustees from funds provided by the state legislature fall by $300 to **$1,900** per student-year; (3) Your scholarship falls by $150 to **$350** per year.

   Make these changes in the cost data on page 15, and answer the following:

   a. How much would it now cost *you,* as a student, to attend college for a nine-month school year? Indicate the components of your cost.

   b. How much would it now cost *state taxpayers* to send you to college for this time? Indicate the cost components.

   c. How much would it now cost *society* to send you to college for this time? Indicate the cost components.

3. Summary

   a. Did the cost of a college education rise or fall under this policy? (Be sure to consider more than one perspective in your answer.)

   b. Are there other implicit costs that might arise from this policy change? (Hint: Consider the social benefits of college education.) Explain.

ACTIVITY 5

Types of Economic Systems

People and societies organize economic life to deal with the basic problems raised by scarcity and opportunity cost through what is called an economic system. An economic system can be described as the collection of institutions, laws, activities, controlling values, and human motivations that collectively provide a framework for economic decision making.

In a world of scarcity and opportunity cost, all societies must decide the basic economic questions of what goods and services to produce, which ones to forgo or postpone, and when and how to transfer productive resources from one use to another. Decisions must also be made about how much effort to devote to increasing total output as well as how to divide the total output of a society among its members—that is, how to distribute the total real income an economic system generates. These decisions all hinge on how economic resources are allocated.

There are three basic approaches to economic decisions about resource allocation. One is based on tradition, that is, people generally repeat the decisions made at an earlier time or by an earlier generation. A second is based on command, that is, decisions are made largely by an authority, such as a dictator or a government planning agency. Authority in a command economy can be exercised in a democratic fashion or it can be imposed from above by people whose power is not subject to the outcome of free elections. The third is based on markets.

A market economy is a system of decentralized decision making in which individuals and business firms, in their various capacities as consumers, producers, workers, savers, and investors, participate in the market through decisions that are reflected in the supply and demand for various goods and services. The market "adds up" these millions of decisions about supply and demand and forges out of them an interrelated network of market prices that reflect the preferences of all the participants. Market prices—and the changes in them—act as signals to producers, telling them what buyers want. Market prices also act as rationing devices by allocating productive resources and finished goods and services among members of society according to what buyers are willing and able to pay.

No real-world economy is a pure form of a traditional, a command, or a decentralized market economy. Every existing economy uses a different "mix" of allocating mechanisms to answer the basic economic questions, and each has somewhat different institutions, controlling values, and motivating forces at work that affect the operation of the economy. The element of tradition is, for example, most evident in the rural areas of the developing countries of Asia, Africa, and Latin America. The element of command was most evident in the nations of the former Soviet Union and other centrally planned economies, such as China, North Korea, and Cuba. Decentralized or market decision making is most evident in the United States, Australia, Canada, and Western Europe; but even among countries, considerable diversity exists in the amount of government planning and in the variety of economic institutions.

Understanding how economic decisions are made in a particular economy requires careful attention to questions such as the following:

1. What is the actual "mix" of allocating mechanisms? That is, how many economic decisions are tradition oriented? How many are made by central command? How many are left to decentralized market forces?
2. What are the most important economic institutions of the society, and what role do they play in shaping economic decisions?
3. What are the controlling values and motivating forces that condition economic behavior in the society?
4. What, if any, significant changes appear to be taking place in the economic system?

From *Master Curriculum Guide in Economics: A Framework for Teaching the Basic Concepts*, 2d ed. (New York: National Council on Economic Education, 1984), pp. 16-17.

ACTIVITY 5 continued

Finally, it should be noted that people of all societies, regardless of the type of economic system, engage in certain basic economic activities. These include producing, exchanging, and consuming goods and services, as well as saving and investing so that capital goods and human capital can be accumulated to increase output and productivity. The distinguishing characteristics of an economic system thus are not the economic activities that are carried on but the kinds of economic institutions that exist and the way in which they influence decision making.

List three examples of tradition, command, and market elements in the U.S. economy.

Tradition

1. _____
2. _____
3. _____

Command

1. _____
2. _____
3. _____

Market

1. _____
2. _____
3. _____

ACTIVITY 6
Broad Social Goals of a Society

The broad social goals that relate to economics and which are given considerable importance in American society today are economic freedom, economic efficiency, economic equity, economic security, economic stability (full employment and the absence of inflation), and economic growth. These goals, and the importance attached to each of them, guide individuals and society in the making of decisions. The goals provide targets and a sense of direction in formulating the means for reaching these targets.

These goals can also be thought of as criteria for evaluating the performance of the economic system (or parts of the system) and for examining the usefulness of new as well as existing programs.

1. Economic Freedom

Freedom as an economic goal concerns the freedoms of the marketplace—the freedom of consumers to decide how they wish to allocate their spending among various goods and services, the freedom of workers to choose to change jobs, join unions, and go on strike, the freedom of individuals to establish new businesses and to decide what to produce and when to change the pattern of production, the freedom of savers to decide how much to save and where to invest their savings. Of particular interest is the effect of actions by individuals, groups, or governments to enhance or restrict freedom in the marketplace and thereby affect the possible attainment of the other goals of efficiency, equity, security, stability, and growth. A number of people argue that government regulation limits the freedom of some people to make their own choices. Others argue that government policies may free some people to take greater advantage of the opportunities provided in a market economy. Given the differences in viewpoint, it is essential to define the kinds of freedom under discussion and whose behavior is most likely to be affected.

2. Economic Efficiency

Efficiency can have two meanings. The term can refer to technical efficiency, which focuses on using the least input of resources to obtain some stated level of output, or obtaining the highest level of output using fixed inputs of specified resources. Technical efficiency alone cannot indicate the most appropriate decision to make. An economy may be technically efficient in producing good A, for example, but if consumers do not want good A and prefer good B instead, then it would not be economically efficient to produce good A.

Economic efficiency is a broader concept than technical efficiency. Economic efficiency goes beyond technical efficiency and takes into account the costs and benefits associated with various market preferences and decisions. In order to obtain maximum benefits from using our limited resources, we should undertake only those economic actions which result in additional benefits that exceed the additional costs. By this standard, economic actions should not be undertaken if the additional costs exceed the additional benefits. The concept of economic efficiency is central in economics, and it should receive heavy emphasis in both individual and social decision making.

3. Economic Equity

Equity, which deals with what is "fair" and what is "unfair" or what is "right" and what is "wrong," is difficult to define precisely. Economic equity can be described as the application of our concepts of what is fair and what is unfair—or of what "ought to be" and "ought not to be"—to economic policy. To be sure, people differ in their conception of what represents equity or fairness. However, in evaluating economic performance, the concept serves as a reminder to investigate which or what kinds of people are made better or worse off as a result of, for example, a change in prices or the introduction of a new government program.

Though two actions may appear to be equally efficient from an economic standpoint, one could benefit the old and another the young, one might benefit consumers and another producers, and so on. Many people would not be indifferent about who benefits from a policy

From *Master Curriculum Guide in Economics: A Framework for Teaching the Basic Concepts*, 2d edition (New York: National Council on Economic Education, 1984), pp. 52-55.

ACTIVITY 6 continued

because they harbor some general idea of what is equitable. From the viewpoint of economics, equity ultimately deals with the distribution of income and wealth. One way of dealing with this question is simply to talk about the effects of economic actions on the distribution of income and wealth: Who gains and who loses? The distinction between equality of opportunity and the equality of results is also important when economic equity is addressed.

4. Economic Security

The goal of economic security concerns the desire of people to be protected against economic risks over which they may have little or no control. Such risks include accidents on their jobs, unemployment, destitution in old age, business failures, bank failures, and precipitous price declines for one's product. Economic security is enhanced by individual efforts, such as saving and the purchase of insurance, as well as by the growth of the economy, through which the mass of people receive more material well-being. Various government programs such as worker's compensation, unemployment compensation, social security, aid to families with dependent children, federal insurance of bank deposits, and farm price supports are also aimed at increasing economic security in the United States. Nations also engage in the quest for economic security by seeking international agreements which assure them of access to key resources or of adequate prices for their exports. In the last analysis, it is the possession of real goods and access to services or assured claims to goods and services that provide economic security.

5. Full Employment

Full employment prevails when all of an economy's resources are utilized to capacity, but most discussion turns on the employment or unemployment of people. In practice, an unemployment rate for people that reflects normal frictional unemployment—unemployment that occurs as workers change jobs or enter the labor force—has come to be viewed as full employment. Debate continues as to what unemployment rate—at present suggestions range from five to six percent of the labor force—constitutes full employment. But keeping the goal of full employment in view helps to remind us of the costs in lost output to the economy and in economic hardship to individuals that result from rates of unemployment that are too high.

6. Price Stability

...[O]verall price stability means the absence of inflation or deflation, not the absence of changes in relative prices in particular markets. In reality, overall price-level changes are not often likely to be zero. Not only do our price indexes fail to reflect some improvements in product quality that in effect lower certain prices, but more important, price changes reflect the push and pull of market forces as changes occur in supply and demand. What constitutes "reasonable" price stability is the subject of much discussion. Nonetheless, this goal recognizes that sharp price changes necessitate costly adjustments in the behavior of individuals and businesses in order to cope with the effects such changes produce.

7. Economic Growth

Economic growth means producing increasing amounts of goods and services over the long term. If the people of a society want to raise their level of living, they must produce more goods and services. If the population is growing, the amount produced must be still greater to provide for the additional people. This is why changes in real GDP per capita (that is, per person) are usually more meaningful than changes in total GDP as a measure of growth.

Economic growth is an important goal in virtually all countries, and is closely related to several of the other goals discussed above. Both individuals and nations try to increase their economic security and well-being by expanding output. Individuals seek ways to enhance their earning ability while nations seek to stimulate the growth of per capita output and income. Economic growth helps provide jobs for a growing labor force, and economic growth also makes it easier for a society to devote some of its output to promoting greater economic equity and greater economic security by assisting

ACTIVITY 6 continued

the disadvantaged, the disabled, or other groups that need help. If output does not grow, one person or one group can obtain more goods and services only if another person or group receives less. But, to revert to an often used metaphor, when a larger economic pie is baked, everyone can have a larger slice.

On the supply side, the upper limit to economic growth is determined by the availability of productive resources, the efficiency with which these resources are used, and the economic, social, and political factors that either encourage or discourage an increase in productive capacity. These latter factors include the size of the market, the value system of the people, and the degree of political stability or instability.

Once the productive capacity of an economy is established, the actual rate of growth in a market economy will be determined by the level of aggregate demand. If an economy is in a recession and aggregate demand is too low to fully employ existing resources, there will be little market incentive to increase productive capacity. Thus, there is a close relationship between the short-run goal of full employment and the long-run goal of economic growth. As we have indicated, the existence of rapid inflation also hinders the long-run expansion of a nation's total productive capacity.

1. Which goals do you think are most important? Why?

2. In column 1, rank the economic goals listed below from 1 to 7 according to the emphasis that you think the goal is given in the U.S. economy today. Rank the most important goal 1 and the least important goal 7. In column 2, rank the economic goals according to the emphasis that you think they should be given. Be prepared to support your opinions.

Goal	**Column 1** Emphasis Given	**Column 2** Emphasis That Should Be Given
Economic Freedom	_____	_____
Economic Efficiency	_____	_____
Economic Equity	_____	_____
Economic Security	_____	_____
Full Employment	_____	_____
Price Stability	_____	_____
Economic Growth	_____	_____

ACTIVITY 7
Campus Parking

Good parking spaces on the Stanford campus (as on most campuses) are at a premium, especially on rainy days. Stanford has about 11,000 students—of whom about half live on campus—about 1,000 faculty, and perhaps 8,000 nonteaching "staff members" and other such employees. Sampling suggests that perhaps 8,000–15,000 drivers may seek parking on a rainy day.

Although there is no simple way to indicate the number of desirable parking spaces available (desirability depends on where one wishes to go on the campus), perhaps 1,500–2,000 spaces are very convenient to different parts of the central campus. Including all outlying areas of the campus (perhaps 3 to 5 blocks from classrooms and offices), a large number of additional parking spaces are available.

For many years, by tradition the best parking spaces were exclusively set aside for faculty members (via free "A" parking stickers), and the next most desirable ones for staff members (via free "B" stickers). Other reasonably close-in spaces were allocated to students at a small charge ("C" stickers). Distant campus parking was free to all. Some special parking was provided for physically disabled persons.

Not surprisingly, students frequently complained, as indeed did faculty and staff from time to time, since on rainy days there was an excess demand for all three reserved parking areas. In this setting, the president's office announced that the parking situation was being reassessed and invited all concerned to submit their views. Five major approaches developed:

1. ***Leave things as they have been.*** (This was quite popular with the faculty, who all got "A" stickers.) Faculty were seldom made late to class by shortage of good parking, and most staff and students could manage pretty well if they allowed a little extra time for getting where they were going. But you can guess what the anti-establishment students said.
2. ***First-come, first-served.*** This would let students, faculty, and staff alike compete for the best parking places, which would presumably go to those who felt the greatest need for them. Your willingness to set the alarm ahead 10 minutes to get a reasonable parking space would be the best measure of how important the better place was to you. Who could make a better decision for you—and Stanford? Advocates of this plan emphasized its equity in treatment of the various groups on campus. Everyone has the same chance at the parking spaces (faculty and students, rich and poor, sleepers and early risers) and all would have an equal chance to get there first—or would they?
3. ***Markets and a price system.*** A third alternative would allocate the spaces by selling them. Put a rent on each space and let the one who is willing to pay the most for it rent it each semester or year. It would probably be convenient to group all the spaces into three or four classes—"A" spaces and stickers for the best locations, "B" for the next best, and "C" for the least attractive. A price would be set for each sticker area that would roughly equate the number of stickers bought with the number of spaces available in that class. Thus, those who would pay the most would get the "A" spaces, the most desirable areas, at a higher price; those who paid less would get the "B" stickers; those who paid still less would get "C" stickers; and those unwilling to pay at all would use the outlying areas. There would be a liberal sprinkling of metered areas on campus for those who wanted to buy short-term parking.

   Advocates of this plan argued that it would basically give the best parking spaces to those who were willing to pay for them, which is the way we allocate almost everything else in our society, and would in essence let the students and faculty themselves determine who got the best spaces. (In this plan, as in the others, special allowances would be made for handicapped students who needed special parking assis-

From George Leland Bach, *Microeconomics: Analysis, Decision Making and Policy*, 11th ed. (Englewood Cliffs, NJ: Prentice-Hall, 1987), pp. 10–11. Reprinted by permission of Prentice-Hall, Inc., Englewood Cliffs, NJ. All Rights Reserved.

ACTIVITY 7 continued

tance; there was little dispute over this point.) Faculty members, staff, and students would all have the same chance to get good parking. There would be no discrimination in price within each of the three groups.

4. ***Democracy.*** A fourth group argued that none of these approaches was obviously superior to the present system and that in accordance with democracy, students, faculty, and staff should all together elect a special parking committee to say who should get these places each year and how. There was some dispute over how this committee should be elected and what representation should be given to each of the various parking-demand groups on campus. Support for this alternative apparently depended in considerable part on the decision as to how the representatives should be chosen.

5. ***Random choice.*** A few hearty souls, especially those from the statistics department, proposed an allocation of parking spaces through a random process. Tickets for the various classes of parking around the campus would be given out on a basis of random choice. That is, random numbers would be put in a bowl, with one number assigned to each person (faculty, students, and staff) who wanted to be in on the drawing. Then the stickers would be allocated on the basis of the numbers drawn out of the bowl in a random fashion. Many observers said this was a wasteful way of doing it since it would obviously not take advantage of the preferences of different students and faculty members for different classes of lots. A few sophisticated souls suggested that this random process be utilized, and then let develop on campus a market for the tickets allocated through the random process. In this market, presumably the various stickers would be bid up in price until the people who wanted them the most had obtained them by paying a higher price for them than would be paid by parkers who wanted them less strongly. Many participants argued that this would be very unfair to those who needed parking space and had to pay for the space to those who won the best places in the drawing, even though some of the latter didn't even have cars.

How should Stanford allocate its limited supply of desirable parking spaces? In addition to the questions already raised above in the general discussion of the problem, you may want to consider the following questions:

1. Is your main goal to maximize equity or to obtain the most efficient allocation of resources (parking spaces)?
2. Should people who live on or near the campus have the same chance of getting good parking spaces as people who live a considerable distance away?
3. Does democracy or the price system give a more efficient allocation of resources here? a more equitable allocation of resources?
4. Is this problem significantly different from the allocation of other scarce goods in our society—for example, the supply of apartments near the campus for those who live off campus? hamburgers? Porsche autos? high-grade doctors to provide medical services when needed?

If you choose alternative 1 above, what criterion should the administration use if it is going to charge different amounts for stickers on different parts of the campus? Should Stanford, as a substantial monopolist, maximize its profit by charging the highest price it can get so as to obtain the most funds possible from the plan?

ACTIVITY 7 continued

1. What is the central problem that Stanford faces in parking spaces?

2. What are the three ways societies deal with scarcity? Categorize the five methods Stanford could use to allocate parking spaces. Which use tradition? command? the market?

3. Explain how each method of allocating parking spaces affects *equity*.

4. Explain how each method of allocating parking spaces affects *efficiency*.

5. Which system of allocating parking spaces do you recommend? Why?

ACTIVITY 8

Why Communism Failed

From the Czar to Yeltsin: One Woman's Story

As communism collapses in the Soviet Union it is time to tally up the cost of its 74-year reign. Valentina Kosteva, now 94, saw communism come and now she has seen it go. In the "Gulag Archipelago," Alexander Solzhenitsyn noted that "if you get a letter completely free of self-pity," it can only be from a victim of the Soviet terror. "They are used to the worst the world can do, and nothing can depress them." He might have been writing about Mrs. Kosteva. Recently she told her story to the Journal's David Brooks. It is presented here in slightly condensed form.

I was born in 1898 in Samara, a city on the Volga. I was only with my mother, as my father left us when I was three or four. We had relatives in Kazan, another city on the Volga, where my grandfather had a little shop where he made boots, and he was able to offer us a small room in his house. I studied in the woman's school, and we prayed for the health of the czar every morning, and then we sang together as a chorus, "God Bless the Czar."

Perhaps among the peasants there was a mood against the czar, for they were dependent for everything, but I didn't recognize any striking opposition. Those who worked hard and got money could live by their own standards—people could improve themselves by labor. Since my grandfather made boots we had something. Peasants would come to him and say, "I've been wearing your boots for 25 years. I'm sick of them. Make me another pair."

Of course there were many products in the stores. We never lived as we live now. We could buy enough food for the whole winter, for example. The cellars were full of ice and we stocked meat and chicken and so on. There was plenty of everything.

The revolution started in 1905. A lot of Cossacks came to Kazan to suppress it there. The pogroms started—the stores, homes, everything was ransacked. My uncle was told to clear out his watch store before everything was destroyed. As he and his 12-year-old son were running down the street, some Cossacks appeared and they began to shoot. The bullets hit the father in the hip and the son in the leg. The boy made it to the hospital and said, "They have shot my father." The father's leg was amputated, and he never regained his health. The watch store had to close.

In 1914 we moved to Kalmytskaya, which is on the lower Volga, and we met the revolution there. We did not learn of it immediately. But after the revolution, bands of troops roamed around our region, Red bands, White bands and some that were not affiliated with either side. One night some White soldiers came to my door and I let them stay at my house, just for humanitarian reasons. I cannot say I was against Soviet power.

When they went away the Reds came and I was arrested because I had housed White soldiers for a night. Under guard I was taken to the militia and the commander told his soldiers to shoot me. But my mother had followed and she begged the officer, saying I was just a young girl who didn't know what she was doing, and in that way she saved my life.

Shortly afterward I married a Kalmyk. He was at the university in the literature department, and when the Soviet power was imposed upon this region, he had an education, and so he was immediately elected the head of local Soviet committee. Later he was appointed head of the Ministry of Education for the Kalmyk region.

After the revolution all foreign goods became unavailable and if you were a rich person you were repressed. Some rich people were shot. Some were sent to Siberia. Some just had their possessions taken.

During the [New Economic Policy] years it was wonderful. Everything was in the stores. Everything you liked was there; it was just necessary to have money. Then in Stalin's time everything became terrible again. People were arrested, for example, for being five minutes late to work. A woman in my office was arrested right from work, in the same dress, and sent to Siberia for five years, with no opportunity to say goodbye to her children. We were frightened all the time. We couldn't speak, and especially if you said something about Stalin. If you said something you could only wait to be arrested.

My husband was arrested in 1937. They came for him one night and told me and my children that in 20 minutes we should be out of the apartment. There was no explanation. We wandered around the city that night looking for shelter and finally found a peasant who was willing to share her room. After that everybody refused just to talk to me. Even my best friends. They wouldn't even say hello to me. They were afraid.

For a time he was kept in different jails, under the control of the KGB. Two times I was able to see him in prison. When we saw each other, it was prohibited to tell certain things. For example, it was prohibited for me to answer him when he asked where our daughter was.

He was sentenced to five years and sent to Magadan, which is very far east, and he died there. I don't know whether he died from disease or was killed there.

Many, many years later, in 1956, I received a short letter, just a few sentences, that said his arrest was a mistake and that he was not guilty of anything.

During World War II, all the Kalmykian region was occupied. My daughter, her son and I moved out of our house while the German planes were overhead. They were shooting at us. We fled to Aktyubintz but they didn't accept us. They said they had too many refugees already. Then we were to move to Tashkent, but we didn't make it. We settled in Kazakhstan. Everything we brought with us we exchanged for food products. By then I was working as an accountant and we were there for a year and a half, until our home region was free.

At the time we fled my son was in military training. They were taking young guys and training them to become partisans. All of those boys were then sent behind the lines of the German forces. It was very difficult for them to fight in that region because there are no forests, no places to hide. It's very open, just plain. My son's unit was betrayed and surrounded, and only two were taken alive—my son and one other boy.

The Gestapo arrested him and asked: "Why should you fight for the Soviets? The Soviets killed your father. Why won't you work with us?" I was told that he became so enraged that he lifted up the chair and he began to fight with the soldiers. They beat him to death. He was 17.

After the war Stalin repressed not only certain people but also certain nations. The Kalmyks were repressed totally. They had just come home after the German troops were pushed back to the West when the Soviet troops came and moved them away from their place again. I was especially not allowed to live there as the wife of a People's Enemy. My daughter went to Kiev and later she called me there, so I went to Kiev, until 1966.

During those years I was always busy with my job, so I didn't think much. I couldn't tell anybody what had happened to my husband because I needed that job. And then in 1966 I moved to Moscow with my grandson's family, with my great-granddaughter and great-grandson, and now we are all a family.

On the night of the coup, we could see the tanks come by our window [1 ½ blocks from the Russian Parliament building]. My grandson was out jogging. I told him, "They are making a coup and you are jogging!" There was no television on the first day, but we could hear the broadcasts from Mr. Yeltsin. In the evenings the family made coffee and food for the young people who were at the barricades. After the second day, I could follow events on the television. Everybody thinks communism is finished. I am happy it is.

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ACTIVITY 8 continued

1. What economic system did Russia use before communism?

2. According to Valentina Kosieva, what economic system had the most emphasis under the New Economic Policy?

3. Why do you think the New Economic Policy was ended?

4. Was communism primarily based on tradition, command, or the market system? *(Circle one.)*

5. Evaluate the communist system using Valentina Kosieva's story and reading from your textbook. How would you evaluate the performance of communism on these goals?

   Economic Freedom

   Economic Efficiency

   Economic Equity

   Economic Security

   Full Employment

   Price Stability

   Economic Growth

ACTIVITY 9

The Hatfields and the McCoys

The Hatfields and the McCoys don't talk to each other very much. They would rather shoot than smile. The Hatfields are better off than the McCoys in every way. Why, it takes only 8 hours for one Hatfield to grow 1 bushel of corn and only 10 hours for one Hatfield to make 1 yard of cloth.

The McCoys aren't any more (or less) shiftless than the Hatfields, but their land is worse, and their tools aren't as good. Anyway, it takes 15 hours for one McCoy to grow 1 bushel of corn and 12 hours for one McCoy to make 1 yard of cloth. The McCoys are worse off than the Hatfields because they have to work longer for everything they want.

Now old Ma Hatfield is a sly one, and she's been sitting and rocking and thinking for years and years. One day she says, "Pa! Pa! I've been cogitating. You know what I think? I think we'd be a whole lot better off if we stopped fighting the McCoys, spent more time raising corn, and traded with the McCoys when we need cloth."

Paw spat. "Darnit, woman," he said. "We are better farmers than those varmints and better weavers, too! Besides, I don't want to be dependent on that poor excuse for a family for my clothes."

Can you help Ma and Pa settle this? Using the following worksheet, try to figure out who is right.

To produce corn and cloth, the Hatfields must spend:

_____ hours for 1 bushel of corn
_____ hours for 1 yard of cloth
_____ hours for total production of 1 bushel of corn and 1 yard of cloth

To produce corn and cloth, the McCoys must spend:

_____ hours for 1 bushel of corn
_____ hours for 1 yard of cloth
_____ hours for total production of 1 bushel of corn and 1 yard of cloth

If the Hatfields produce only corn and trade 1 bushel of corn for 1 yard of cloth, they would spend:

_____ hours for 2 bushels of corn
_____ hours to have 1 bushel of corn and 1 yard of cloth through trade

If the McCoys produce only cloth and trade 1 yard of cloth for 1 bushel of corn, they would spend:

_____ hours for 2 yards of cloth
_____ hours to have 1 yard of cloth and 1 bushel of corn through trade

If the Hatfields and McCoys specialize in the lowest cost production, will they gain any time?

1. Will both families gain in the trade? _____
2. Who had an absolute advantage in corn? _____
3. Who had an absolute advantage in cloth? _____
4. Who had a comparative advantage in corn? _____
5. Who had a comparative advantage in cloth? _____

This lesson has been modified from student materials prepared for the Close Up Foundation's Pacific Rim Conference and a lesson from *An Economics Course for Elementary School Teachers* (New York: National Council on Economic Education, 1975). For more information about Close Up's program for high school students and teachers on Pacific Rim Trade in San Francisco please call (703) 892-5400.

ACTIVITY 10

Anything Worth Doing Is Not Necessarily Worth Doing Well

From early childhood, most of us have been taught that "anything worth doing is worth doing well." Asked if we agree with the statement, most of us would say that we do.* It is only natural for a person to prefer a well-done job to one that is not so well done; indeed, such a position is fully consistent with the basic assumption in economics that more (quality) is preferred to less (quality). And it is easy to understand why people may not like to redo something that has already been done, particularly if the combined time involved is greater than the time that would have been required to do it right in the first place.

People obviously do not behave the way they profess that people should behave. There is probably not a minister around who has not written what he, himself, considered at the time to be a poor sermon, and the author has recently built a bookcase that was more or less thrown together. Women and men have cooked dinners that they knew in their hearts were seriously deficient in one respect or another. Students regularly choose to work for a grade of C instead of going all-out for an A. This is true even though A is the preferred grade. How many, do you suppose, of the students who are reading this Activity have written a paper that, by their own standards, fell far short of a well-done paper? In fact, can you say at this point that you have read the last two paragraphs "well"?

Admittedly, people do some things well, but the point we wish to emphasize is that they frequently do things less than well, not because they do not want to do better, but because of the *additional* cost involved in improving the quality of whatever they are doing. Given the student's ability—which, as a matter of fact, is limited at any point in time—writing a "good" quality A paper generally requires more effort and time than writing a quality C paper. If the student spends additional time on the paper, he or she has less time for doing other things. That student cannot study the subject matter in another course, and thus may do less well there or even fail; the student cannot use the time for physical exercise or spend the time sleeping or out on dates. To reiterate, there is usually an additional cost that must be borne for a higher-quality paper, and it is because of this cost that a student may rationally choose to turn in a paper that may just get by. (Even so, the student may still hope for an A. Can you explain why?)

If the cost is not greater for a higher-quality piece of work, then one must wonder why the job may be done poorly. In this case, the student will be able to have a higher-quality paper without giving up anything. The problem of the poorly done work may be one of perception; that is, the student may perceive the additional cost to be greater than what it actually is, in which case he or she should respond appropriately if provided with accurate information. The student may, in addition, inaccurately assess the benefits.

Quite often, one person will admonish another to do a good job and become upset if the quality does not change. For example, the person doing the marking may be distressed at the quality of the papers received, and may honestly feel that a student who is going to write a paper should write a good one. The marker may be even more distressed to find out that the students spent the last few days doing virtually nothing or having a "good time." The problem here can simply be one of a disagreement between the values that the marker and students place on different activities. The teacher may view the paper as being of greater value than the students do and may view the "other activities" as being of less value. Consequently, the teacher believes it is in the student's best interest to do a better paper.

*James Buchanan has suggested that an economist can be distinguished from a non-economist by the reaction of each to the statement: "Anything worth doing is worth doing well." "Economics and Its Scientific Neighbors," in *The Structure of Economic Science: Essays on Methodology*, ed., Sherman Roy Krupp (Englewood Cliffs, NJ: Prentice-Hall, 1966).

Exercise developed by Professor Richard B. McKenzie, Clemson University, Clemson, SC. From *Common Sense Economics II* (February 1974).

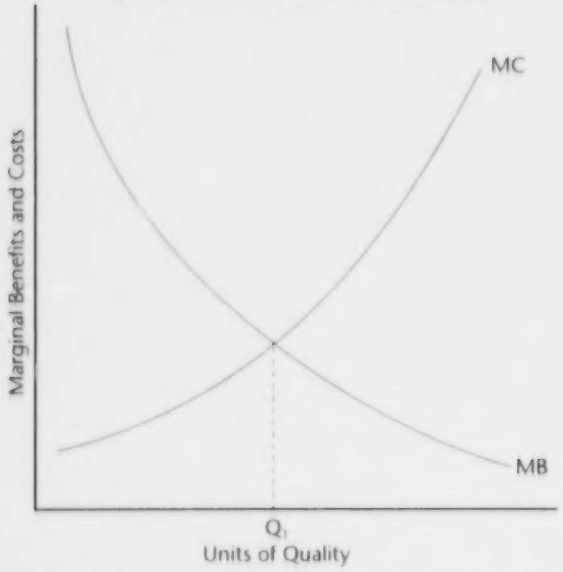
ACTIVITY 10 continued

However, since the students view the value of the other activities as being higher, they, in effect, view the cost of doing the better paper as being higher. Of course, it is clearly rational for the teacher to want the students to turn in better papers, but if the teacher had to bear the cost, one might anticipate a change in attitude.

The same line of argument can be used to explain why the preacher's sermon is of low quality, even though he or she may have the ability to do better. If the preacher writes a better sermon, there may be the cost of not seeing parishioners in the hospital or giving up something else that he or she considers valuable. The family member may have to forgo writing letters, discussions with neighbors, or other work in order to cook a better meal.

What should be the quality level toward which a person should strive? The utility-maximizing individual should raise the quality of whatever he or she does until the extra (or marginal) benefits received from an additional unit of quality is equal to its extra (or marginal) cost. Suppose that the marginal benefits for units of quality diminish as the total quality of the work goes up. It seems rather likely that the additional effort required to improve the paper becomes greater and greater as the quality level is raised. (There is increasing marginal cost to increasing the quality.) The diminishing marginal utility assumption is represented by the downward sloping curve (MB) in the diagram *Marginal Benefits and Costs of Quality* below. The upward sloping curve represents the increasing marginal cost (MC). Notice that we have labeled the horizontal axis "Units of Quality." (The actual good or service involved can be anything.) The utility-maximizing quality level is Q_1. Before Q_1 the marginal utility of an additional unit of quality is greater than the marginal (or additional) cost. Marginal cost can be viewed as the utility forgone in some alternative activity. For early changes in quality MB > MC, and the individual can acquire more utility than he or she gives up in some other activity. This may happen in the range where the paper improves from a grade of F to a grade of D, and can continue as long as the marginal utility of a unit of effort exceeds its marginal cost.

Marginal Benefits and Costs of Quality



Each student will have his or her own notion of where Q_1 is for his or her particular case. By expanding the quality toward Q_1, the utility of the individual can rise. If the person extends the quality level beyond Q_1, notice that the marginal cost of doing so would be greater than the marginal utility. The result is that the person's total utility level would be less than it would be at Q_1. An outside observer (such as a teacher) may feel that the quality of the work done by the student, Q_1, may be quite low—and it may even be low by the standards of the individual, but this does not make his or her behavior any less rational. In other words, anything worth doing is not necessarily worth doing "well."

As a postscript, the principle applies equally to the current Activity. It might be possible to improve the explanatory power or the form of the Activity through additional effort—converting the message into blank verse or iambic pentameter, for example. However, this effort involves a huge increase in marginal cost, one not compensated for in marginal benefits, assuming the basic message has already been successfully communicated. The rationale for not working further is identical to the rationale of a student who concludes that a grade of B will suffice because an A does not repay the cost: Anything worth doing is not necessarily worth doing well.

ACTIVITY 10 continued

1. Why might you not work to get an A on your next economics test?

2. Why might your teacher want you to do a better paper than you want to do?

3. Why is the marginal benefit (MB) curve downsloping?

4. Why is the marginal cost (MC) curve upsloping?

5. How should you determine how well you should do something?

6. Can you think of something you didn't do well recently? Explain why you didn't do it as well as you could have.

7. Explain in your own words why something worth doing is not necessarily worth doing well.

ACTIVITY 11

Thinking in an Economic Way

Economics is a way of thinking that views people as rational decision makers. Economists believe people prefer more to less. While each person has different values, all people seek to maximize their welfare. Some people want fast cars and yachts; some want big houses and a good life for their families; and others may even value education.

Because of costs, people cannot get everything they want. As you answer these problems, you must be sure to evaluate costs and benefits. And never forget the concept of scarcity.

1. True, false, or uncertain, and why? "The best things in life are free."

2. Is life priceless? Give at least four examples to support your opinion. Use the concept of opportunity cost in your answer.

3. Teachers are usually displeased when students cheat on tests. Which of these methods intended to stop cheating would be most effective? Why?
   a. Teachers should say nothing and trust the students to be fair. If people are treated responsibly, they will act responsibly.
   b. Teachers should give lectures on morality and explain to students how their actions are not only dishonest but may hurt their classmates.
   c. Teachers should walk around the room when giving tests, give students alternate tests, and make sure the students understand they will fail if they are caught cheating.

4. True, false, or uncertain, and why? "The economic concept of scarcity is not relevant to a modern economy such as the United States. Americans are surrounded by vast quantities of unused goods. For example, food fills the supermarkets, and every car dealer has many cars in the showroom and lot. Americans are surrounded by plenty, not scarcity."

Exercise developed by John Morton.

ACTIVITY 11 continued

5. True, false, or uncertain, and why? "Money is one of America's most important economic resources."

6. An economics professor got a new job in a new town. When he arrived in the new town, he wanted to rent an apartment. He pulled into the first gas station he saw, filled up his tank, and drove around inspecting apartments. He rented the tenth apartment that he inspected. Does his behavior make sense economically, or did he fail to practice what he preaches? Use marginal benefit and marginal cost analysis in your answer.

7. Tina is an outstanding lawyer. She also types faster than anyone else in her town. Tom types at half the speed of Tina. Tom is not a lawyer. Should Tina hire Tom? Why or why not? Use the concepts of absolute and comparative advantage in your answer.

Sample Multiple-Choice Questions

Circle the letter of each correct answer.

1. To be considered scarce, an economic resource must be:
   I. Limited.
   II. Free.
   III. Desirable.

   a. I only
   b. I and II only
   c. II and III only
   d. I and III only
   e. I, II, and III

2. The basic economic problem is reflected in which of the following concepts?
   I. Scarcity
   II. Opportunity cost
   III. Production possibilities
   IV. The fallacy of composition
   V. *Ceteris paribus*

   a. I only
   b. IV only
   c. II and III only
   d. I, II, and III only
   e. I, II, and IV only

3. Which of the following goods would be considered scarce?
   I. Education
   II. Gold
   III. Time

   a. I only
   b. II only
   c. III only
   d. I and II only
   e. I, II, and III

4. The value of the best alternative forgone when a decision is made defines:
   a. Economic good.
   b. Opportunity cost.
   c. Scarcity.
   d. Tradeoff.
   e. Comparative advantage.

5. A recurring theme in economics is:
   a. People have unlimited wants in the face of unlimited resources.
   b. People have limited wants in the face of unlimited resources.
   c. There are more resources than wants.
   d. People face limited resources with their limited wants.
   e. People face limited resources with their unlimited wants.

6. An example of the opportunity cost of producing an additional unit of product A is:
   a. All of the human and capital resources used to produce product A.
   b. The retail price paid for product A.
   c. The wholesale price of product A.
   d. The amount of product B which cannot now be produced because of product A.
   e. The profit that could have been made from producing product B.

SAMPLE MULTIPLE-CHOICE QUESTIONS continued

7. In which way does a straight-line production possibilities curve differ from a concave production possibilities curve?
   a. A straight-line production possibilities curve has a decreasing opportunity cost.
   b. A straight-line production possibilities curve has a constant opportunity cost.
   c. A straight-line production possibilities curve has an increasing opportunity cost.
   d. A straight-line production possibilities curve does not show opportunity cost.
   e. There is no difference between the two production possibilities curves.

8. The law of increasing opportunity cost is reflected in the shape of the:
   a. Production possibilities curve concave to the origin.
   b. Production possibilities curve convex to the origin.
   c. Horizontal production possibilities curve.
   d. Straight-line production possibilities curve.
   e. Upward-sloping production possibilities curve.

9. Now that Bob packages only french fries and Sue packages only hamburgers, they can service twice as many customers as they did before the change. This illustrates the concept of:
   a. Comparative advantage.
   b. Scarcity.
   c. Traditional economy.
   d. Cost.
   e. Command economy.

The diagram below is used for questions 10-12. It shows the production possibilities curve for the country with full employment of a given-size labor force.

10. If the country is currently producing at point a, it can produce more industrial goods by moving to point:
    a. a b. b c. c d. d e. e

11. Which of the following statements about the production possibilities curve is true?
    a. Point d is not attainable given the society's resources.
    b. Point c lies outside the production possibilities boundary because it represents a combination of resources not desired by the citizens of the country.
    c. Elimination of unemployment will move the production possibilities curve to the right, closer to point c.
    d. The relative positions of points a and b reflect production possibilities rather than relative prices.
    e. Point b is not attainable in a developed country.

SAMPLE MULTIPLE-CHOICE QUESTIONS continued

12. How might point c be attained?
    a. If the country's resources were more fully employed.
    b. If the country's resources were shifted to encourage more efficient use of scarce resources.
    c. If improvements in technology occurred in either the industrial goods or the agricultural goods sector.
    d. If firms decreased their output of industrial goods.
    e. If the nation used more of its scarce resources to produce agricultural goods.

13. This question is based on the following table, which represents a factory's production outputs:

Combination	Videotape recorders	CD players
A	12	10
B	15	9
C	18	7
D	20	4

    The opportunity cost of moving from combination C to D is:
    a. 2 videotape recorders.
    b. 20 videotape recorders.
    c. 3 CD players.
    d. 4 CD players.
    e. 5 CD players.

14. Which of the following would cause an outward or rightward shift in the production possibilities curve?
    a. An increase in unemployment.
    b. An increase in inflation.
    c. An increase in capital equipment.
    d. A decrease in natural resources.
    e. A decrease in the number of workers.

15. Use the following information to answer this question:

Country	One bushel of soybeans	One bushel of rice
U.S.	5 hours	7 hours
Japan	15 hours	10 hours

    Based on this information, which of these statements is/are true?

    I. The United States has an absolute advantage in producing soybeans.
    II. Japan has an absolute advantage in producing rice.
    III. Japan has a comparative advantage in producing soybeans.
    IV. The United States should specialize in the production of soybeans, and Japan should specialize in the production of rice.

    a. I only.
    b. III only.
    c. I and IV only.
    d. II and IV only.
    e. I, II, III, and IV

Sample Short Essay Questions

1. Why is there no such thing as a free lunch?

2. True, false, or uncertain, and why? "Garbage is a scarce economic good because it is limited."

3. Use the concept of opportunity cost to explain why both people and nations specialize and trade.

4. True, false, or uncertain, and why? "If you won a million dollars in the lottery, you wouldn't have the economic problem of scarcity."

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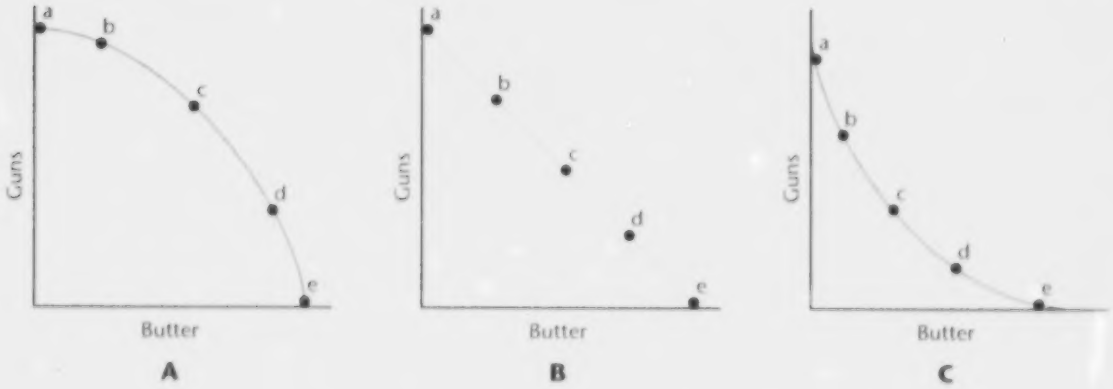
Sample Long Essay Questions

1. Every society has the fundamental economic problem of scarcity.
   a. What is scarcity?
   b. What three questions must every society answer because of scarcity?
   c. What are the three ways societies have dealt with the scarcity problem?
   d. Give one example of how each way is used in the United States.

2. Explain what would have to be true in each case for the production possibilities curves to be shaped as they are in A, B, and C.



Microeconomics

Unit 2

The Nature and Function of Markets

Key Ideas

- A diagram of the circular flow of resources, goods and services, and money payments is a simplified way of illustrating how a market economy operates. Prices in the product market and prices in the factor market are determined by the interaction of supply and demand. This diagram is also called the circular flow of income.
- Demand is the relationship between the quantities of a good that consumers are willing and able to purchase and the various prices in a given period of time. The law of demand states that consumers buy more at lower prices and less at higher prices.
- There is a difference between a change in demand and a change in quantity demanded. A change in quantity demanded can only be caused by a change in the price of the good. It is a movement along the demand curve. At a lower price, a greater quantity is demanded. A change in demand means that more or less is demanded at every price; it is caused by changes in preferences, incomes, population, and the prices of complementary or substitute goods.
- The income effect, the substitution effect, and the law of diminishing marginal utility can explain why a demand curve is downsloping.
- The law of diminishing marginal utility states that as more of a good or service is consumed in a given period of time, the additional benefit or satisfaction declines.
- Supply is the relationship between price and the amount that producers are willing and able to sell at various prices in a given period of time. Producers are willing to sell more at higher prices and less at lower prices.
- There is a difference between a change in supply and a change in quantity supplied. A change in quantity supplied can only be caused by a change in the price of a good. It is a movement along the curve. A change in supply is a shift of the curve where more or less is supplied at every price. A change in technology or a change in production costs will cause a shift in supply.
- In competitive markets, supply and demand constitute the sum of many individual decisions to sell and to buy. The interaction of supply and demand determines the price and quantity that will clear the market. This is where quantities supplied and quantities demanded are equal. It is called the equilibrium or market-clearing price.
- Equilibrium price and quantity are determined as follows. At a price higher than equilibrium, there is a surplus and pressure on sellers to lower their prices. At a price lower than equilibrium, there is a shortage and pressure on buyers to offer higher prices.
- An administered maximum price is called a price ceiling. A price ceiling below the equilibrium price causes shortages.
- An administered minimum price is called a price floor. A price floor above the equilibrium price causes surpluses.
- Price elasticity of demand refers to how much the quantity demanded changes in relation to a given change in price. If the percentage change in quantity demanded is greater than the percentage change in price, the demand for the good is considered elastic. If the percentage change in quantity demanded is less than the percentage change in price, the demand for the good is considered inelastic. If the percentage change in price is equal to the percentage change in quantity demanded, the demand for the good is considered unit elastic.
- Luxuries have a more elastic demand than necessities. High-priced goods have a more elastic demand than low-priced goods. Goods that are habit-forming tend to have an inelastic demand. Demand is more elastic in the long run than in the short run.
- Elasticity of demand can be determined by using the total revenue and arc methods.
- Price elasticity of supply, also mentioned in percentage terms, refers to how much quantity supplied changes in relation to a given change in price. Supply is more elastic in the long run than in the short run.
- In a market economy, prices provide information, allocate resources, and act as rationing devices. It is important to know how to illustrate a wide range of situations with supply-and-demand graphs.

ACTIVITY 12

The Circular Flow of Resources, Goods, Services, and Money Payments

One way of illustrating the overall operation of a market economy is through a circular flow diagram such as the one on this page. This diagram presents a highly simplified overview of how a market economy operates. Owners of resources (families and individuals) supply the services of their land, labor, and capital to business firms in exchange for money income payments in the form of wages, salaries, rents, interest, and profits. Owners of the resources in turn use these income payments to purchase the finished goods and services supplied by the business firms. Business firms then use the proceeds from these sales to pay the resource owners for the services the firms receive by employing the resources. This is how the circular flow of resources, goods and services, and money income payments is established and maintained.

Payments in the lower loop (sometimes called the factor market) appear as income to the resource owners who sell productive services, but these same payments appear as costs to the business firms that buy productive services. Likewise, payments in the upper loop (sometimes called the product market) appear as costs to the resource owners who buy goods and services, but these same payments appear as income to the business firms that sell goods and services.

An important point to emphasize is that all of the money payments shown in the diagram are determined by an interdependent set of market prices. In a system of interdependent market prices, every price depends to some extent on every other price. The prices resource owners are willing to pay for finished goods and services depend on the prices (income) they receive for the use of their resources. The prices of resources, in turn, depend on how much business firms are willing to pay for the services the resources provide. The amount that businesses are willing to pay for resources depends on the prices they receive for the finished goods and services they sell, but the prices business firms receive depend on what resource owners are willing to pay for goods and services. And so, round and round, the process continues.

The Circular Flow of Resources, Goods, Services, and Money Payments

Adapted from *Master Curriculum Guide in Economics: A Framework for Teaching the Basic Concepts* (New York: National Council on Economic Education, 1993), p. 24.

ACTIVITY 12 continued

Both resource owners and business firms would like to receive higher prices for what they sell and to pay lower prices for what they buy, but these objectives are not easy to attain when the prices that buyers pay are also the prices that sellers receive. As you will see in this unit, a market system relies on the interaction between sellers (supply) and buyers (demand) to reconcile these conflicting objectives and to establish prices in particular markets. Competition among sellers gives buyers a choice in deciding from whom (if anyone) to buy, and competition among buyers gives sellers a choice in deciding to whom (if anyone) to sell.

1. a. What is a resource owner?

   b. What is a business firm?

2. What is the product market?

3. Give three examples of transactions you made this week in the product market.

4. What is the factor market?

5. Give an example of a transaction you or your family made this month in the factor market.

6. What determines the prices of goods and services in the product market?

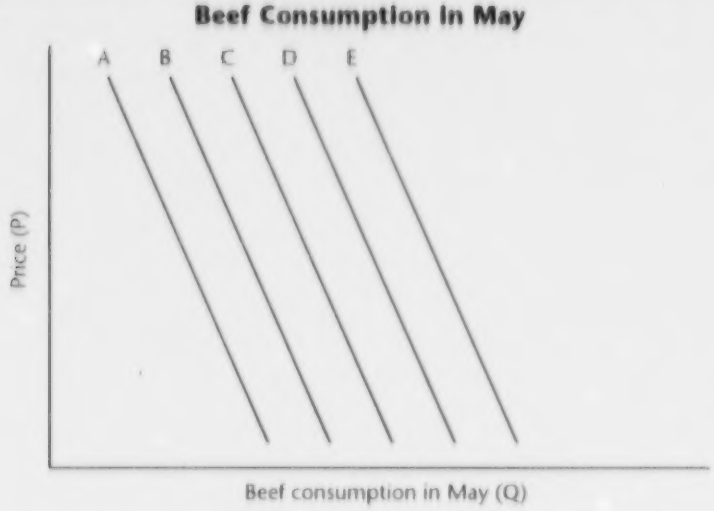
7. What determines the prices of land, labor, capital, and entrepreneurship in the factor market?

8. Where do resource owners get the money to buy goods and services in the product market?

9. Where do business firms get the money to pay resource owners for their land, labor, capital, and entrepreneurship in the factor market?

10. Why is it important to know that a market economy is characterized by interdependence?

ACTIVITY 13
Reasons for Changes in Demand



Part A.
Read the following eight newspaper headlines. In each case decide if the event will cause a change in the demand for beef. If so, determine if it is an increase or a decrease, and write the correct answer. Begin at curve *C*. If you think headline 1 means there will be a decrease in demand, write "decrease" in the first blank and "B" in the second blank; move to curve *B* to do headline 2. If you think demand will increase, write "increase" and "D" in the blanks for headline 1; move to curve *D* to do headline 2. If no change, write "N.C."

Move only one curve at a time. Do not skip from, say, *A* to *C*, even if you think the headline means there will be a large change in demand. Do not go beyond the five curves. If you are at *A* and the next headline implies a decrease in demand, you goofed somewhere. There is one headline that implies that the demand for beef does not change.

1. **Price of Beef to Rise in June**
   Demand _____ Curve _____

2. **Millions of Immigrants Swell U.S. Population**
   Demand _____ Curve _____

3. **Pork Prices Drop**
   Demand _____ Curve _____

4. **Surgeon General Warns That Eating Beef Can Be Hazardous to Health**
   Demand _____ Curve _____

5. **Beef Prices Fall; Consumers Buy More**
   Demand _____ Curve _____

From *Master Curriculum Guide in Economics: Teaching Strategies for High School Economics Courses* (New York: National Council on Economic Education, 1985), p. 68.

ACTIVITY 13 continued

6. **Real Income for Americans Drops Third Month in Row**
(Beef is considered a normal good.)
Demand _____ Curve _____

7. **Charcoal Shortage Threatens Memorial Day Cookouts**
Demand _____ Curve _____

8. **Nationwide Fad: The Disco-Burger**
Demand _____ Curve _____

Part B.
Categorize each change in demand in Part A according to the reason that demand changed. Write the number of the headline(s) next to the reason for the change in demand. One category will have two headline numbers.

_____ A change in consumer expectations

_____ A change in consumer tastes

_____ A change in the number of consumers in the market

_____ A change in income

_____ A change in the price of a substitute good

_____ A change in the price of a complementary good

ACTIVITY 14

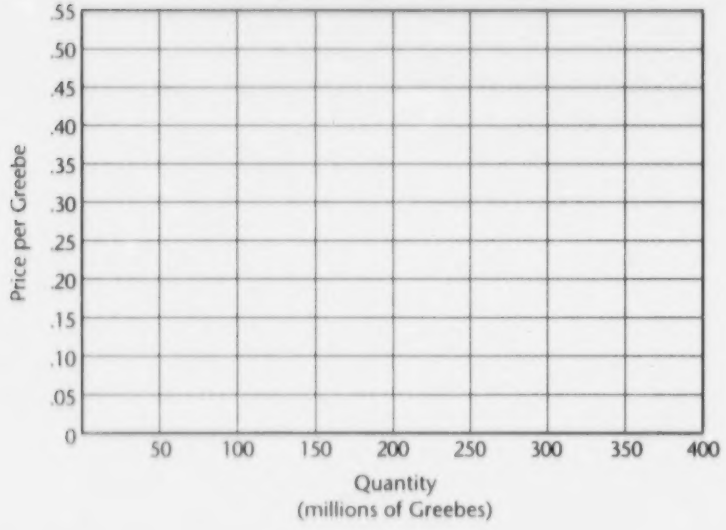
Demand Curves, Moves Along Demand Curves, and Shifts in Demand Curves

Below is a table showing the market demand for Greebes, a hypothetical product introduced to spare you the confusion of real-world associations. Study the data in the table, and plot the demand for Greebes on the axes provided below. Label the demand curve *D*, and answer the questions that follow.

Demand for Greebes

Price ($ per Greebe)	Quantity demanded (millions of Greebes)
$.10	350
.15	300
.20	250
.25	200
.30	150
.35	100
.40	50

Plotting Demand for Greebes



Part A.
Fill in the answer blanks or cross out the incorrect words in parentheses.

The data for demand curve *D* indicate that at a price of $.30 per Greebe, buyers would be willing to buy _____ million Greebes. Other things constant, if the price of Greebes increased to $.40 per Greebe, buyers would be willing to buy _____ million Greebes. Such a change would be a decrease in *(demand/quantity demanded)*. Other things constant, if the price of Greebes decreased to $.20, buyers would be willing to buy _____ million Greebes. Such a change would be called an increase in *(demand/quantity demanded)*.

Adapted from Phillip Saunders, *Introduction to Microeconomics: Student Workbook*, Fifteenth edition, Bloomington, IN, 1993.
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ACTIVITY 14 continued

Now, to take another example, let's suppose that there is a dramatic increase in federal income tax rates that reduces the disposable income of Greebe buyers. This change in the *ceteris paribus* (all else being equal) conditions underlying the original demand for Greebes will result in a decrease in demand, and we would have a new set of data, such as that shown in the table *Decrease in the Demand for Greebes*. Study the data in the new table, and plot the new demand curve for Greebes on the axes, *Plotting Demand for Greebes*. Label the new demand curve D_1 and answer the questions that follow.

Decrease in the Demand for Greebes

Price ($ per Greebe)	Quantity demanded (millions of Greebes)
$.05	300
.10	250
.15	200
.20	150
.25	100
.30	50

Comparing the new demand curve (D_1) with the old demand curve (D), we can say that a decrease in the demand for Greebes results in a shift of the demand curve to the *(right/left)*.

Such a shift indicates that at each of the possible prices shown, buyers are now willing to buy a *(smaller/larger)* quantity, and at each of the possible quantities shown, buyers are willing to offer a *(higher/lower)* maximum price.

Now, let's suppose that there is a dramatic increase in people's "taste" for Greebes. This change in the *ceteris paribus* conditions underlying the original demand for Greebes will result in an increase in demand, and we would have a new set of data such as that shown in the table *Increase in the Demand for Greebes*. Study the data in the new table, and plot this demand for Greebes on the axes. Label the new demand curve D_2 and answer the questions that follow.

Increase in the Demand for Greebes

Price ($ per Greebe)	Quantity demanded (millions of Greebes)
$.20	350
.25	300
.30	250
.35	200
.40	150
.45	100
.50	50

Comparing the new demand curve (D_2) with the old demand curve (D), we can say that an increase in the demand for Greebes results in a shift of the demand curve to the *(right/left)*.

Such a shift indicates that at each of the possible prices shown, buyers are now willing to buy a *(smaller/larger)* quantity, and at each of the possible quantities shown, buyers are willing to offer a *(higher/lower)* maximum price.

ACTIVITY 14 continued

Part B.
Now, the dog work over, see if you have the point by circling the letter of the answer you think is the one best alternative in each of the following multiple-choice questions.

1. Other things constant, which of the following would *not* cause a change in the demand (shift in the demand curve) for mopeds?

   a. A decrease in consumer incomes.

   b. A decrease in the price of mopeds.

   c. An increase in the price of bicycles.

   d. An increase in people's tastes for mopeds.

2. "Rising oil prices have caused a sharp decrease in the demand for oil." Speaking precisely, and using terms as they are defined by economists, choose the statement that best describes this quotation:

   a. The quotation is correct—an increase in price always causes a decrease in "demand."

   b. The quotation is incorrect—an increase in price always causes an increase in "demand," not a decrease in "demand."

   c. The quotation is incorrect—an increase in price causes a decrease in the "quantity demanded," not a decrease in "demand."

   d. The quotation is incorrect—an increase in price causes an increase in the "quantity demanded," not a decrease in "demand."

3. "As the price of domestic automobiles has inched upward, customers have found foreign autos to be a better bargain. Consequently, domestic auto sales have been slipping and foreign auto sales have been moving briskly." Using only the information in this quotation and assuming everything else constant, which of the following best describes this statement?

   a. A shift in the demand curves for both domestic and foreign automobiles.

   b. A movement along the demand curves for both foreign and domestic automobiles.

   c. A movement along the demand curve for domestic autos and a shift in the demand curve for foreign autos.

   d. A shift in the demand curve for domestic autos, a movement along the demand curve for foreign autos.

4. A fellow student is heard to say the following: "Economic markets are like a perpetual see-saw. If demand rises, the price rises; if price rises, then demand will fall; if demand falls, price will fall; if price falls, demand will rise ... and so on forever." Dispel your friend's obvious confusion (in no more than one short paragraph) below.

ACTIVITY 15

Why Is a Demand Curve Downsloping? The Law of Diminishing Marginal Utility

To most people, the law of demand is obvious. Consumers buy more at a lower price and less at a higher price. Economists, however, go beyond describing the combined demand of all consumers in a market. To explain why a demand curve is downsloping or negatively sloped, they focus on the demand curve of a single consumer.

The *total utility* of a quantity of goods and services to a consumer can be represented by the maximum amount of money he or she is willing to give in exchange for them. The *marginal utility* of a good or service to a consumer (measured in money terms) is the maximum amount of money he or she is willing to pay for one more unit of the good or service. With these definitions, we can now state a simple idea about consumer tastes. The more of a good a consumer has, the less will be the marginal utility of an additional unit. The exercise below illustrates how economists use the law of diminishing marginal utility to derive a negatively sloped demand curve.

Part A.
The table *Marginal Utility of Dress Purchases* presents data on Dolores' evaluation of different quantities of dresses.

1. Use these data to compute the marginal utility of each dress.

2. The optimal purchase rule says to buy more dresses as long as the marginal utility of the next dress exceeds the price of the dress. According to this rule, how many dresses should Dolores buy if they cost
   $90 each?_____
   $60 each?_____
   $40 each?_____

Marginal Utility of Dress Purchases

Dresses	Total Utility	Marginal Utility
0	$0	
		$110
1	$110	
		$100
2	$210	
		$80
3	$290	
		$_____
4	$360	
		$_____
5	$410	
		$_____
6	$440	
		$_____
7	$460	

Adapted from Craig Swan, *Study Guide for Baumol and Blinder Economics: Principles and Policy*, 6th ed. (Fort Worth: Harcourt Brace & Co., 1994), pp. 100–102.

ACTIVITY 15 continued

3. Now, fill in the blank columns of the table *Marginal Utility of Dress Purchases at Three Prices* to compute the difference between total utility and total expenditures for each price. Total utility has been taken from the table *Marginal Utility of Dress Purchases*. What quantity maximizes the difference between total utility and total expenditures when price equals

   $90?_____

   $60?_____

   $40?_____

Marginal Utility of Dress Purchases at Three Prices

		Price=$90		Price=$60		Price=$40	
Total Utility	Dresses	Total Expenditure	Difference*	Total Exp.	Diff.*	Total Exp.	Diff.*
110	1	$90	$20	$60	$50	$40	$70
210	2	$180	_____	$120	_____	$80	_____
290	3	$270	_____	$180	_____	$120	_____
360	4	$360	_____	$240	_____	$160	_____
410	5	$450	_____	$300	_____	$200	_____
440	6	$540	_____	$360	_____	$240	_____
460	7	$630	_____	$420	_____	$280	_____

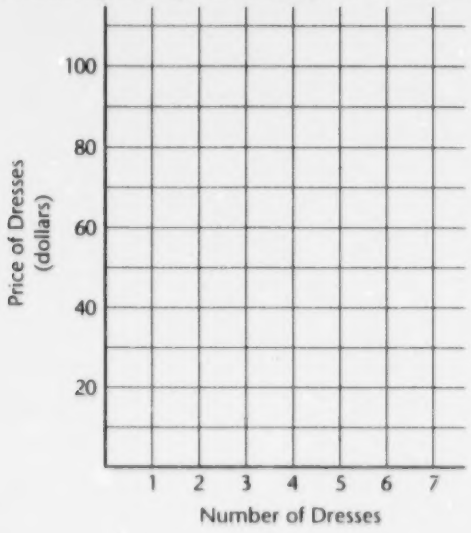
*Differences between total utility and total expenditures

4. Total utility is the maximum amount Dolores would pay for various quantities of dresses. The difference between what she would be willing to pay and what she has to pay is called consumer surplus. How do the quantities determined using the optimal purchase rule in question 1 compare with those determined by maximizing consumer surplus in question 3?

5. Use the information in the table *Marginal Utility of Dress Purchases* to plot Dolores' demand curve for dresses in *Plotting Marginal Utility of Dress Purchases* on the following page. Is your demand curve consistent with your answers to questions 2 and 3? (It should be.)

ACTIVITY 15 continued

Figure 1
Plotting Marginal Utility of Dress Purchases



Part B.
Consider the following information on Joel's total utility for CD purchases, and then circle the letters of each correct answer of the questions that follow.

Total Utility of CDs

Number of CDs	Total Utility
1	$25
2	$45
3	$63
4	$78
5	$90
6	$100
7	$106
8	$110

1. What marginal utility is associated with the purchase of the third CD?
   a. $18
   b. $21
   c. $45
   d. $63

2. What is Joel's consumer surplus if he purchases three CDs at $11 apiece?
   a. $30
   b. $33
   c. $63
   d. $96

ACTIVITY 15 continued

3. What would happen to Joel's consumer surplus if he purchased an additional CD at $11?
   a. Consumer surplus declines by $11.
   b. Consumer surplus increases by $11.
   c. Consumer surplus increases by $15.
   d. Consumer surplus increases by $4.

4. How many CDs should Joel buy when they cost $11 apiece?
   a. 0
   b. 3
   c. 5
   d. 7

5. What is Joel's consumer surplus at the optimal number of CD purchases?
   a. $35
   b. $55
   c. $79
   d. $100

6. If CDs go on sale and their price drops to $8, how many CDs do you expect Joel to buy?
   a. 5
   b. 6
   c. 7
   d. 8

ACTIVITY 16

Reasons for Changes in Supply

Part A.
Read the following seven newspaper headlines. In each case, decide if the event will cause any change in the supply of cars. If so, determine if it is an increase or a decrease, and write the correct answer. Begin at curve *C*. If you think headline 1 means there will be a decrease in supply, write "decrease" in the first blank and "B" in the second blank; move to curve *B* to do headline 2. If you think supply will increase, write "increase" and "D" in the blanks for headline 2; move to curve *D* to do headline 3. If no change, write "N.C."

Move only one curve at a time. Do not skip from, say, *A* to *C*, even if you think the headline means there will be a large change in supply. Do not go beyond the five curves. If you are at *A* and the next headline implies a decrease in supply, you goofed somewhere. There is one headline that implies that the supply of cars does not change.

1. **Auto Workers' Union Agrees to Wage and Fringe Cuts**

   Supply _____ Curve _____

2. **New Robot Technology Increases Efficiency**

   Supply _____ Curve _____

3. **Nationwide Auto Strike Began at Midnight**

   Supply _____ Curve _____

4. **New Auto Import Quotas Reduce Flow of Foreign Cars**

   Supply _____ Curve _____

From *Master Curriculum Guide in Economics: Teaching Strategies for High School Economics Courses* (New York: National Council on Economic Education, 1985), p. 59.

ACTIVITY 16 continued

5. **Cost of Steel Rises**

   Supply _____ Curve _____

6. **Auto Producer Goes Bankrupt, Closes Operation**

   Supply _____ Curve _____

7. **Buyers Reject New Models**

   Supply _____ Curve _____

Part B.
Categorize each change in supply according to the reason that affected supply. Write the number of the headline next to the reason for the change in supply. In some cases, more than one headline could be matched to a reason.

_____ A change in the cost of production

_____ A change in technology

_____ Natural disaster/other event that causes decrease in production

_____ Government policies

ACTIVITY 17

Supply Curves, Moves Along Supply Curves, and Shifts in Supply Curves

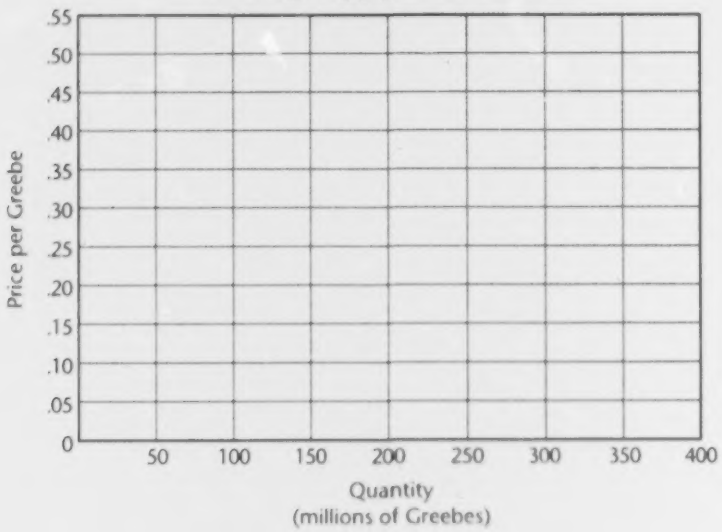
Long-run competitive market supply curves usually slope "up to the right," but not always. If each firm in the market could expand its output with a constant marginal cost, and if new firms could enter the market with exactly the same costs as the firms already in the market, the long-run supply curve would be a "perfectly elastic" horizontal line, but this is not likely in very many cases. Typically, firms in a competitive market experience increases in their marginal cost as output expands beyond a certain point, and firms entering a competitive market as price rises usually have higher costs than firms already in the market at lower prices. (If marginal cost continues to fall as output expands, only one firm would ever be in the market and, by definition, there could not be a competitive market supply curve.)

In this Activity, and those that follow, we will assume that the long-run supply curve of Greebes is "typically" upward sloping. Study the data in the table *Supply of Greebes*, and plot the supply of Greebes on the axes provided. Label the supply curve *S*. and answer the questions that follow.

Supply of Greebes

Price ($ per Greebe)	Quantity supplied (millions of Greebes)
$.15	100
.20	150
.25	200
.30	250
.35	300

Plotting Supply of Greebes



Adapted from Phillip Saunders, *Introduction to Microeconomics: Student Workbook*, Fifteenth edition, Bloomington, IN, 1993.
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ACTIVITY 17 continued

Part A.
Fill in the answer blanks or cross out the incorrect words in parentheses.

The data for supply curve *S* indicate that at a price of $.25 per Greebe, suppliers would be willing to offer _____ million Greebes. Other things constant, if the price of Greebes increased to $.30 per Greebe, suppliers would be willing to offer _____ million Greebes. Such a change would be an increase in *(supply/quantity supplied)*.

Other things constant, if the price of Greebes decreased to $.20 per Greebe, suppliers would be willing to offer _____ million Greebes. Such a change would be called a decrease in *(supply/quantity supplied)*.

Now let's suppose that there is a dramatic increase in the price of several of the raw materials used in making Greebes. This change in the *ceteris paribus* conditions underlying the original supply of Greebes will result in a decrease in supply, and we would have a new set of data, such as that shown in the table *Decrease in Supply of Greebes*. Study the data in the new table, and plot this supply of Greebes on the axes. Label the new supply curve S_1 and answer the questions that follow.

Decrease in Supply of Greebes

Price ($ per Greebe)	Quantity supplied (millions of Greebes)
$.20	50
.25	100
.30	150
.35	200
.40	250

Comparing the new supply curve (S_1) with the old supply curve (S), we can say that a decrease in the supply of Greebes results in a shift of the supply curve to the *(right/left)*.

Such a shift indicates that at each of the possible prices shown, suppliers are now willing to offer a *(smaller/larger)* quantity, and at each of the possible quantities shown, suppliers are willing to accept a *(higher/lower)* minimum price.

Now, to take another example, let's suppose that there is a dramatic decrease in the price of several of the raw materials used in making Greebes. This change in the *ceteris paribus* conditions underlying the original supply of Greebes will result in an increase in supply, and we would have a new set of data, such as that shown in the table *Increase in Supply of Greebes*. Study the data in the new table, and plot this supply of Greebes on the axes. Label the new supply curve S_2 and answer the questions that follow.

Increase in Supply of Greebes

Price ($ per Greebe)	Quantity supplied (millions of Greebes)
$.10	150
.15	200
.20	250
.25	300
.30	350

Comparing the new supply curve (S_2) with the old supply curve (S), we can say that an increase in the supply of Greebes results in a shift of the supply curve to the *(right/left)*.

ACTIVITY 17 continued

Such a shift indicates that at each of the possible prices shown, suppliers are now willing to offer a *(smaller/larger)* quantity, and at each of the possible quantities shown, suppliers are willing to accept a *(higher/lower)* minimum price.

Part B.
Now, the dog work over, see if you have the point by circling the letter of the answer you think is the one best alternative in each of the following multiple-choice questions.

1. Other things constant, which of the following would *not* cause a change in the long-run supply of beef?

   a. A decrease in the price of beef.

   b. A decrease in the price of cattle feed.

   c. An increase in the price of cattle feed.

   d. An increase in the cost of transporting cattle to market.

2. "Falling oil prices have caused a sharp decrease in the supply of oil." Speaking precisely, and using terms as they are defined by economists, choose the statement that best describes this quotation.

   a. The quotation is correct—a decrease in price always causes a decrease in "supply."

   b. The quotation is incorrect—a decrease in price always causes an increase in "supply," not a decrease in "supply."

   c. The quotation is incorrect—a decrease in price causes an increase in the "quantity supplied," not a decrease in "supply."

   d. The quotation is incorrect—a decrease in price causes a decrease in the "quantity supplied," not a decrease in "supply."

ACTIVITY 18

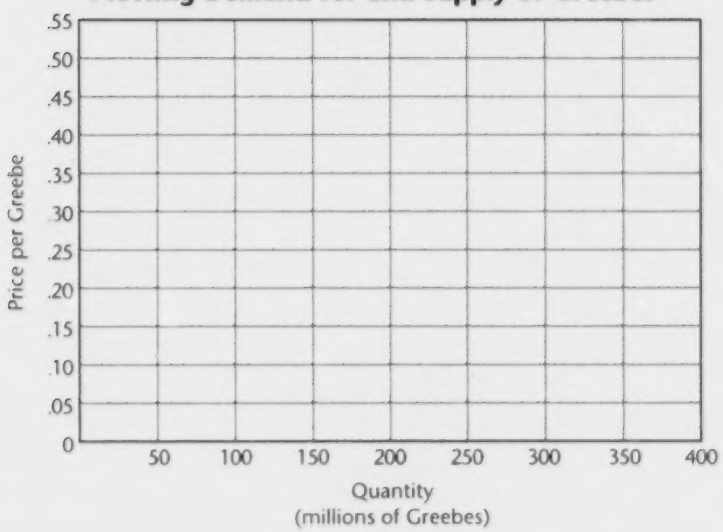
Equilibrium Prices and Equilibrium Quantities

Below is a table showing the demand for Greebes and the supply of Greebes. Plot these data on the axes provided. Label the demand curve "D," and label the supply curve "S." Then answer the questions that follow.

Demand for and Supply of Greebes

Price ($ per Greebe)	Quantity Demanded (millions of Greebes)	Quantity Supplied (millions of Greebes)
$.15	300	100
.20	250	150
.25	200	200
.30	150	250
.35	100	300

Plotting Demand for and Supply of Greebes



Fill in the answer blanks or cross out the incorrect words in parentheses.

1. Under these conditions, competitive market forces would tend to establish an equilibrium price of $_____ per Greebe and an equilibrium quantity of _____ million Greebes.

2. If the price currently prevailing on the market is $.30 per Greebe, buyers would want to buy _____ million Greebes and sellers would want to sell _____ million Greebes. Under these conditions, there would be a *(shortage/surplus)* of _____ million Greebes. Competitive market forces would tend to cause the price to *(increase/decrease)* to a price of $_____ per Greebe.

   At this new price, buyers would now want to buy _____ million Greebes, and

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ACTIVITY 18 continued

sellers would now want to sell _____ million Greebes. Due to this change in *(price/underlying conditions)*, the *(demand/quantity demanded)* changed by _____ million Greebes, and the *(supply/quantity supplied)* changed by _____ million Greebes.

3. If the price currently prevailing on the market is $.20 per Greebe, buyers would want to buy _____ million Greebes and sellers would want to sell _____ million Greebes. Under these conditions, there would be a *(shortage/surplus)* of _____ million Greebes. Competitive market forces would tend to cause the price to *(increase/decrease)* to a price of $_____ per Greebe.

   At this new price, buyers would now want to buy _____ million Greebes, and sellers would now want to sell _____ million. Due to this change in *(price/underlying conditions)*, the *(demand/quantity demanded)* changed by _____ million Greebes, and the *(supply/quantity supplied)* changed by _____ million Greebes.

4. Now, suppose that a mysterious blight causes the supply schedule for Greebes to change to the following:

Change in Supply of Greebes

Price ($ per Greebe)	Quantity Supplied (millions of Greebes)
$.20	50
.25	100
.30	150
.35	200

Plot the new supply schedule on the axes *Plotting Demand for and Supply of Greebes* and label it S_1. Label the new equilibrium E_1. Under these conditions, competitive market forces would tend to establish an equilibrium price of $_____ per Greebe and an equilibrium quantity of _____ million Greebes.
Compared to the equilibrium price in question 1, we say that, due to this change in *(price/underlying conditions)* the *(supply/quantity supplied)* changed, and both the equilibrium price and the equilibrium quantity changed. The equilibrium price *(increased/decreased)* and the equilibrium quantity *(increased/decreased)*.

ACTIVITY 18 continued

5. Now with the supply schedule at S_1, suppose further that a sharp drop in people's incomes as the result of a nationwide depression causes the demand schedule to change to the following:

Change in Demand for Greebes

Price ($ per Greebe)	Quantity Demanded (millions of Greebes)
$.15	200
.20	150
.25	100
.30	50

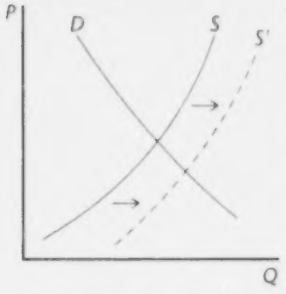
Plot the new demand schedule on *Plotting Demand for and Supply of Greebes* and label it D_1. Label the new equilibrium E_2. Under these conditions, with the supply schedule at S_1, competitive market forces would tend to establish an equilibrium price of $_____ per Greebe and an equilibrium quantity of _____ million Greebes. Compared to the equilibrium price in question 4, due to this change in *(price/underlying conditions)* the *(demand/quantity demanded)* changed. The equilibrium price *(increased/decreased)* and the equilibrium quantity *(increased/decreased)*.

6. If market conditions were represented by D_1 and S, the equilibrium price would be $_____ per Greebe, and the equilibrium quantity would be _____ million Greebes.

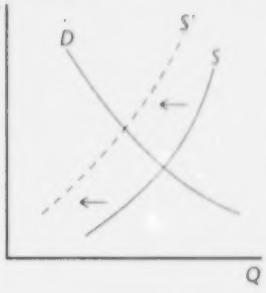
ACTIVITY 19
Shifts in Supply and Demand

Part A.
After each situation, fill in the blank with the letter of the graph that illustrates the situation. You may use a graph more than once. The product being considered is jelly beans.

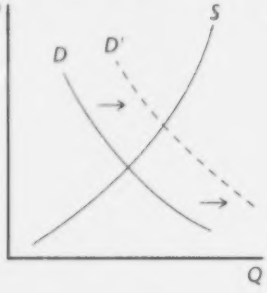
Jelly Beans Supply and Demand A



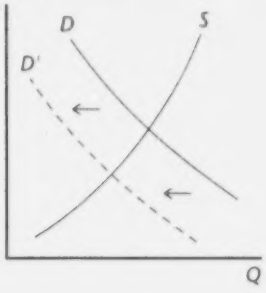
Jelly Beans Supply and Demand B



Jelly Beans Supply and Demand C



Jelly Beans Supply and Demand D

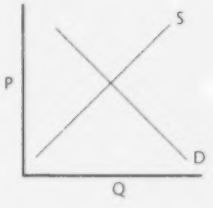


1. The price of sugar increases. _____
2. The price of bubble gum, a close substitute for jelly beans, increases. _____
3. A machine is invented that makes jelly beans at a lower cost. _____
4. The government places a tax on foreign jelly beans that have a considerable share of the market. _____
5. The price of soda pop, a complementary good for jelly beans, increases. _____
6. Widespread prosperity allows people to buy more jelly beans. _____

Part B.
Connecticut ships large amounts of apples to all parts of the United States by rail. Circle the words that show the effects on price and quantity for each situation, and complete the graphs below showing how a hurricane that destroys apples before they are picked in Connecticut might affect the price and quantity of:

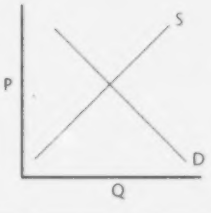
1. Apples in Boston

Price:	Rises	Stays the same	Falls
Quantity:	Rises	Stays the same	Falls



2. Land devoted to apple orchards in the state of Washington

Price:	Rises	Stays the same	Falls
Quantity:	Rises	Stays the same	Falls

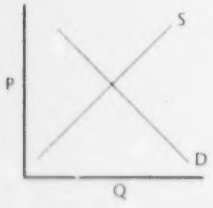


Activity developed by Margaret N. Hamilton, UMS-Wright Preparatory School, Mobile, AL; Mary Kohelis, Brooke High School, Wellsburg, WV; John Morton; and Francis J. Vottero, Shamokin Area High School, Shamokin, PA. Part B adapted from G. Yohe, *Instructor's Resource Manual for Samuelson and Nordhaus Economics*, 14th edition, p. 16.

3. Apples grown in the state of Washington

Price: Rises Stays the same Falls

Quantity: Rises Stays the same Falls



4. Pears

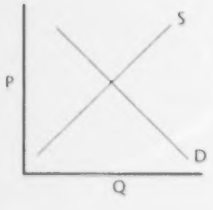
Price: Rises Stays the same Falls

Quantity: Rises Stays the same Falls

5. Apple pies

Price: Rises Stays the same Falls

Quantity: Rises Stays the same Falls



6. The wages of apple pickers in Connecticut

Price: Rises Stays the same Falls

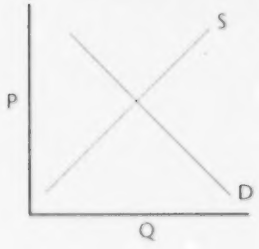
Quantity: Rises Stays the same Falls

ACTIVITY 19 continued

Part C.
Read the following news story (based on an article in *Newsweek*, July 13, 1992) and use the graphs to show how the information in the story might affect various markets.

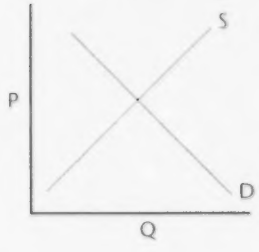
> Cancer researchers have reported that hair dyes may be a cause of cancer. Writing in *The Journal of Public Health*, researchers at the National Cancer Institute reported that women who dye their hair may increase their risk of lymphoma by 50 percent.

Hair dyes

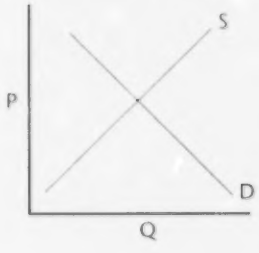


Wigs

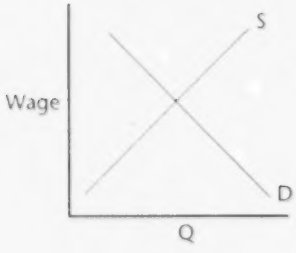
Plastic gloves



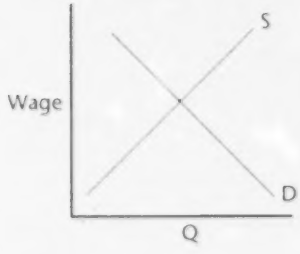
Beauticians



Wig makers



Plastic glove makers



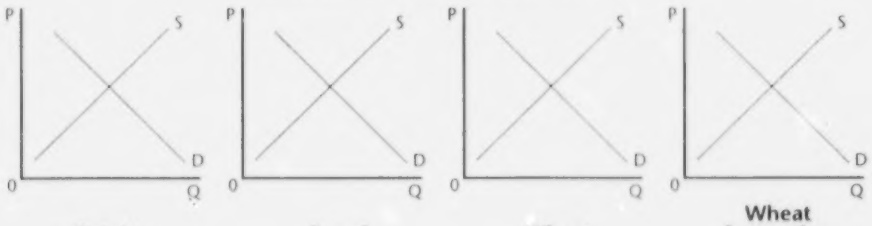
ACTIVITY 20
How Markets Allocate Resources

The following questions refer to a group of related markets in the United States during a long period of time. Assume that the markets are perfectly competitive and that the supply-and-demand model is completely applicable. The diagrams show the supply and demand in each market *before* the assumed change occurs. Trace through the effects of the assumed change, *other things constant*. Work your way from left to right. Shift only one curve in each market.

For each market, draw whatever new supply or demand curves are needed, labeling each new curve S_1 or D_1. Then circle the correct symbol under each diagram (↑ for increase, — for unchanged, and ↓ for decrease). Remember to shift only one curve in each market.

1. Assume that a new fertilizer dramatically increases the number of potatoes that can be harvested with no additional labor or machinery. Also assume that this fertilizer does not affect wheat farming and that people are satisfied to eat either potatoes or bread made from wheat flour.

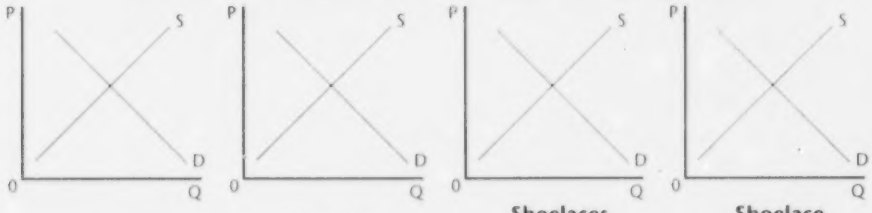
Effects of a New Fertilizer



	Potatoes	Bread	Wheat	Wheat harvesting machinery
Demand:	↑ — ↓	↑ — ↓	↑ — ↓	↑ — ↓
Supply:	↑ — ↓	↑ — ↓	↑ — ↓	↑ — ↓
Equilibrium price:	↑ — ↓	↑ — ↓	↑ — ↓	↑ — ↓
Equilibrium quantity:	↑ — ↓	↑ — ↓	↑ — ↓	↑ — ↓

2. Assume people's tastes change and there is an increase in the demand for briefcases and luggage made out of leather. How would this affect the leather market and related markets? Draw the new curves and circle the appropriate symbols in all four markets.

Effects of Increased Demand for Leather Goods



	Leather	Leather shoes	Shoelaces for leather shoes	Shoelace packaging machinery
Demand:	↑ — ↓	↑ — ↓	↑ — ↓	↑ — ↓
Supply:	↑ — ↓	↑ — ↓	↑ — ↓	↑ — ↓
Equilibrium price:	↑ — ↓	↑ — ↓	↑ — ↓	↑ — ↓
Equilibrium quantity:	↑ — ↓	↑ — ↓	↑ — ↓	↑ — ↓

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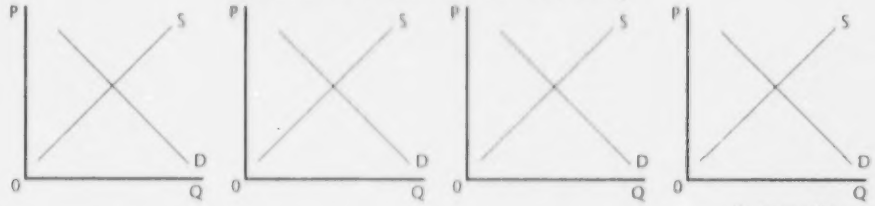
ACTIVITY 20 continued

3. Assume that a heavy frost destroys half the world's coffee crop and that people use more cream in coffee than they do in tea.

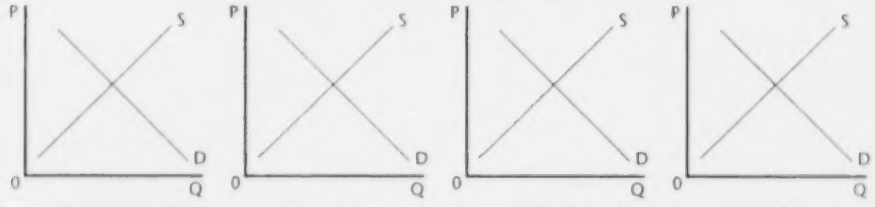
Effects of a Loss of Coffee Crop



	Coffee	Tea	Cream	Automatic coffee makers
Demand:	↑ — ↓	↑ — ↓	↑ — ↓	↑ — ↓
Supply:	↑ — ↓	↑ — ↓	↑ — ↓	↑ — ↓
Equilibrium price:	↑ — ↓	↑ — ↓	↑ — ↓	↑ — ↓
Equilibrium quantity:	↑ — ↓	↑ — ↓	↑ — ↓	↑ — ↓

4. Assume people's tastes change in favor of colored sports shirts, which are worn without neckties, and against white dress shirts, which are worn with neckties.

Effects of a Shift to Sports Shirts



	Sports shirts	Dress shirts	Neckties	Tie clasps
Demand:	↑ — ↓	↑ — ↓	↑ — ↓	↑ — ↓
Supply:	↑ — ↓	↑ — ↓	↑ — ↓	↑ — ↓
Equilibrium price:	↑ — ↓	↑ — ↓	↑ — ↓	↑ — ↓
Equilibrium quantity:	↑ — ↓	↑ — ↓	↑ — ↓	↑ — ↓

ACTIVITY 21

What Is Price Elasticity of Demand?

You have learned that when price changes, the quantity demanded changes. An increase in price causes a decrease in the quantity demanded. A decrease in price causes an increase in the quantity demanded.

However, it is not enough to know that the quantity demanded rises or falls in response to price changes. It is also important to know by how much the quantity demanded changes. A business may decide not to increase the price of a product if people will buy *much less* of it at the higher price. Or, a business may decide to increase the price of a product if people will buy only a *little less* of it at the higher price.

How much the quantity demanded changes in response to price changes is called the *price elasticity of demand*. If the quantity demanded changes considerably, the good or service has an *elastic* demand. Elastic demand means the quantity demanded is very responsive to changes in price. If the quantity demanded changes little, the good or service has an *inelastic* demand. Inelastic demand means the quantity demanded responds relatively little to changes in price.

Several factors can determine if a product has an elastic or an inelastic demand schedule.

Necessities tend to have an inelastic demand. People find it hard to give up a necessity because they cannot readily buy less of it when its price rises. Luxuries tend to have an elastic demand. People can get along without them if the price becomes too high.

Products that have many substitutes tend to have an elastic demand because it is easy to buy a substitute if the price of one product in the group of substitutes rises too much. A product that has few substitutes tends to have an inelastic demand. Buyers don't have much choice if there are few substitutes, so they think twice before giving up such a product when its price rises.

Goods and services that take a large portion of a purchaser's budget tend to have an elastic demand schedule. Those that consume a small portion of a purchaser's budget tend to have an inelastic demand schedule.

Determine whether the demand for the following items is price elastic or inelastic. Write your answer on the line after the item. Then write the reasons for your answer.

1. Salt _____ Why?

2. New cars _____ Why?

3. Pork chops _____ Why?

4. European vacation trip _____ Why?

5. Insulin _____ Why?

6. Insulin at one of four drugstores in a shopping mall _____ Why?

From *Master Curriculum Guide in Economics: Teaching Strategies for High School Economics Courses* (New York: National Council on Economic Education, 1985), p. 93.

ACTIVITY 22

Elasticity of Demand and Changes in Total Revenue

What exactly do we mean by "a considerable change" and "a little change" in the quantity demanded? One way to define elasticity of demand more precisely is to examine what happens to *total revenue* when a price changes. Total revenue is price times quantity demanded.

Price	x	quantity demanded	=	total revenue
$10	x	150 items	=	$1500

What happens to total revenue depends on the *relative size* of the changes in price and the quantity demanded. If the percentage change in the quantity demanded is greater than the percentage change in price, total revenue and the price change will move in opposite directions. This situation indicates that the demand schedule that lies between the two prices is elastic. If the percentage change in quantity demanded is less than the percentage change in price, total revenue and the price change will move in the same direction. This situation indicates that the demand schedule that lies between these two prices is inelastic. Let's summarize these points:

Price ↑ total revenue ↓ = } Elastic
Price ↓ total revenue ↑ = } demand

Price ↑ total revenue unchanged = } Unit elastic
Price ↓ total revenue unchanged = } demand

Price ↑ total revenue ↑ = } Inelastic
Price ↓ total revenue ↓ = } demand

Now let's do some problems to drive home the point. For each problem, complete the mathematics, fill in the answer blanks and circle the correct answer. Then write whether the product has an elastic or inelastic demand schedule between these two prices. The first problem is completed for you.

1. Price rises from $5 to $6. Quantity demanded decreases from 15 to 10.

   a. Old price x quantity demanded = old total revenue

   5 x 15 = 75

   b. New price x quantity demanded = new total revenue

   6 x 10 = 60

   c. P ↓ (↑) TR (↓) ↑ elastic

2. Price falls from $10 to $9. Quantity demanded increases from 100 to 110.

   a. Old price x quantity demanded = old total revenue

   _____ x _____ = _____

   b. New price x quantity demanded = new total revenue

   _____ x _____ = _____

   c. P ↓ ↑ TR ↓ ↑ _____

From *Master Curriculum Guide in Economics: Teaching Strategies for High School Economics Courses* (New York: National Council on Economic Education, 1985), p. 94.

ACTIVITY 22 continued

3. Price rises from $6 to $9. Quantity demanded decreases from 60 to 50.
   a. Old price x quantity demanded = old total revenue

   _____ _____ _____

   b. New price x quantity demanded = new total revenue

   _____ _____ _____

   c. P ↓ ↑ TR ↓ ↑ _____

4. Price falls from $6.50 to $6.00. Quantity demanded increases from 100 to 200.
   a. Old price x quantity demanded = old total revenue

   _____ _____ _____

   b. New price x quantity demanded = new total revenue

   _____ _____ _____

   c. P ↓ ↑ TR ↓ ↑ _____

5. Price falls from $4.00 to $3.75. Quantity demanded increases from 300 to 340.
   a. Old price x quantity demanded = old total revenue

   _____ _____ _____

   b. New price x quantity demanded = new total revenue

   _____ _____ _____

   c. P ↓ ↑ TR ↓ ↑ _____

6. Why do price and total revenue go in opposite directions when the demand for the good is elastic?

7. Why do price and total revenue go in the same direction when the demand for the product is inelastic?

ACTIVITY 23
Applying Elasticity to the Real World

Each of the following stories contains an assumption about elasticity of demand. For each story:

a. State whether the assumption made about the elasticity of demand is correct or is wrong.
b. Justify your answer.

1. I.M. Politico, a candidate for the state legislature, is proposing a large increase in the tax on cigarettes and liquor. He says, "I'm not proposing these taxes to raise revenue but to discourage reckless drinking and the filthy smoking habit. If the prices of cigarettes and booze go up, most people will quit using them. After all, no one needs to drink or smoke."

   a.

   b.

2. U.R. Kool, a candidate for Congress, proposes freezing the price of gasoline. "There is no substitute for gasoline," he says. "People have to get from one place to another. Economists who say higher prices will discourage people from buying as much gas as before don't live in the real world."

   a.

   b.

3. Councilman Vic Acqua opposed a price increase for water during a recent drought. He claimed that there is no substitute for water, and that therefore the demand for water is inelastic. He believes an increase in the price of water (water taxes) will result in the same quantity of water used as before the price went up.

   a.

   b.

4. Sky King, world traveler, says if the airlines want to attract more passengers, they should lower fares for business travelers as well as for vacationers. Both groups should respond equally to a price decrease.

   a.

   b.

From *Master Curriculum Guide in Economics: Teaching Strategies for High School Economics Courses* (New York: National Council on Economic Education, 1985), p.95.

ACTIVITY 24
Elasticity Coefficients

So far, you have used the total revenue method to determine if demand was elastic, inelastic, or unit elastic. Now it is time to get more precise. To gain this precision, economists calculate price *elasticity of demand* (*Ed*) coefficients. The price elasticity of demand coefficient is calculated by dividing the percentage change in quantity demanded by the percentage change in price.

$$Ed = \frac{\text{percentage change in quantity demanded}}{\text{percentage change in price}}$$

Because of different bases, the formula works like this:

$$Ed = \frac{\dfrac{\Delta Q}{(Q_1 + Q_2)/2}}{\dfrac{\Delta P}{(P_1 + P_2)/2}}$$

Because the relationship of quantity demanded and price is inverse, the coefficient will always yield a negative number. However, because it is understood to be negative, we drop the negative symbol. If *E* is greater than 1, demand is elastic. If *E* is less than 1, demand is inelastic. If *E* = 1, demand is unit elastic.

1. Suppose you are given the following data on the market demand for compact discs at a local store:

Local Market Demand for CDs

Price ($)	Quantity demanded per day
12	50
10	70
8	80
6	95

   a. What is the price elasticity of demand over the price range of $12 to $10? _____

   b. What is the price elasticity of demand over the price range of $10 to $8? _____

   The concept of price elasticity also applies to supply. Price *elasticity of supply* (*Es*) is defined as the percentage change in quantity supplied divided by the percentage change in the price of the good. The formula is

$$Es = \frac{\text{percentage change in quantity supplied}}{\text{percentage change in price}}$$

   Because of different bases, the formula works like this:

$$Es = \frac{\dfrac{\Delta Q}{(Q_1 + Q_2)/2}}{\dfrac{\Delta P}{(P_1 + P_2)/2}}$$

ACTIVITY 24 continued

Because price and quantity supplied are a direct relationship, there is no need to change the sign. If E is greater than 1, the elasticity of supply is elastic. If E is less than 1, the elasticity of supply is inelastic. If $E = 1$, elasticity of supply is unit elastic.

2. Suppose you are given some information on market supply for compact discs at a local store:

Local Market Supply for CDs

Price ($)	Quantity supplied per day
12	100
10	90
8	80
6	50

a. What is the price elasticity of supply over the price range of $12 to $10? _____

b. What is the price elasticity of supply over the price range of $10 to $8? _____

In addition to price elasticity of demand, economists determine income elasticity of demand. This measure relates the percentage change in the quantity of a good purchased to the percentage change in income. In most cases, the relationship is positive. An increase in income causes an increase in the quantity of the good purchased. These goods are called *normal goods*. In a few cases, the relationship is negative. These goods are called *inferior goods*. Steak is an example of a normal good; cabbage and turnips might be examples of inferior goods.

3. Suppose you are given the following information on the spending habits of a family:

A Family's Spending Habits

	Income per month	Quantity of potatoes demanded per month	Quantity of steak demanded per month
Year 1	$1,000	4 lb.	2 lb.
Year 2	$1,500	3 lb.	6 lb.

a. What is the income elasticity of demand for potatoes? _____

b. Are potatoes a normal or inferior good? _____

c. What is the income elasticity of demand for steak? _____

d. Is steak a normal or inferior good? _____

e. What qualities make a good inferior or normal?

ACTIVITY 25
Price Floors and Ceilings

Price floors and ceilings can be plotted with supply and demand curves. Use the chart to answer the questions. Fill in the answer blanks or cross out the incorrect words in parentheses.

1. What is the market price? _____

2. What quantity is demanded and what quantity is supplied at the market price?
   a. Quantity demanded _____
   b. Quantity supplied _____

3. What quantity is demanded and what quantity is supplied if the government passes a law requiring the price to be no higher than $30? This is called a *price ceiling*.
   a. Quantity demanded _____
   b. Quantity supplied _____
   c. There is a *(shortage/surplus)* of _____.

4. What quantity is demanded and what quantity is supplied if the government passes a law requiring the price to be no lower than $80? This is called a *price floor*.
   a. Quantity demanded _____
   b. Quantity supplied _____
   c. There is a *(shortage/surplus)* of _____.

A Price Floor and Ceiling

ACTIVITY 26

Rent Controls and Affordable Housing

Imagine that the voters in your city are going to vote on a law that would (1) roll back all rents on houses and apartments to the levels of two years ago and (2) freeze rents at those levels. At the many meetings held on this proposal, citizens have argued furiously. Among the comments you heard was the following:

> "Rents are too high for people on fixed incomes like my husband and me. With prices going up and up, our pension and social security checks just aren't enough. Everyone should have the right to decent housing. We have worked all our lives. Now all we ask is that rents be kept at an affordable level. That's the fair thing to do."

You also heard from the opposite side:

> "Rent controls cause housing shortages. And housing shortages allow rental property owners to discriminate against any group they think is undesirable—families with children or pets, minorities, senior citizens. Also, with rent controls, the rent the owners get over a period of years won't be enough to maintain many older apartments and houses properly. This will lead to blighted neighborhoods. If access to housing is the problem, raising the incomes of poor people—not rent controls—is the answer."

Now you must decide how to vote.

1. What is the issue?

2. Draw a supply and demand graph that illustrates the issue. Does the issue involve a price floor, a price ceiling, or neither?

3. What broad social goals should you consider as you decide how to vote on the issue?

Adapted from *Capstone Student Activities* (New York: National Council on Economic Education, 1989), p. 60.

ACTIVITY 26 continued

4. What are some alternative means of achieving these goals?

5. What are some advantages of each alternative? Be sure to consider who wins and who loses by each alternative.

6. How would you vote on the issue? Why?

ACTIVITY 27

The Minimum Wage and Unemployment

Imagine that you are a member of the U.S. House of Representatives. You must decide whether to vote *yes* or *no* on a bill that would raise the minimum wage. In committee hearings on the bill, you heard testimony from people who favor the increase and from people who oppose it. For example, you heard one spokeswoman say:

> "We're experiencing high inflation. The minimum wage must be raised accordingly. Otherwise, the working poor will receive wages that are miserably below what is needed to provide food, housing, and other necessities. Every worker has a right to earn a decent, living wage. The present minimum is too low and is therefore unjust and unfair."

And you heard an opponent of the minimum wage state:

> "The minimum wage should be allowed to expire. It creates unemployment, especially among disadvantaged minorities and teenagers. It creates incentives for businesses to substitute machines for people. People without jobs are worse off than people with low-paying jobs. This is particularly true for teenagers. Teenage unemployment is much higher than adult unemployment. One of the reasons is that the minimum wage reduces the number of jobs for teenagers with few skills, for at the minimum wage, businesses would rather hire older people who are more skilled or who have more work experience. Such hiring decisions tend to discriminate against young African–Americans who, on the average, have less education and fewer skills than their white counterparts. Don't raise the minimum wage; eliminate it."

Now you must decide how to vote.

1. What is the issue?

2. Draw a supply and demand graph that illustrates the issue. Does the issue involve a price floor, a price ceiling, or neither?

3. What broad social goals should you consider as you decide how to vote on the issue?

Adapted from *Capstone Student Activities* (New York: National Council on Economic Education, 1989), p. 59.

ACTIVITY 27 continued

4. What are some alternative means of achieving these goals?

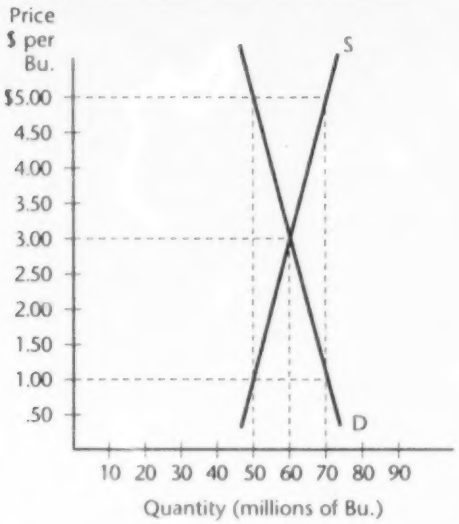
5. What are some advantages of each alternative? Be sure to consider who wins and who loses by each alternative.

6. How would you vote on the issue? Why?

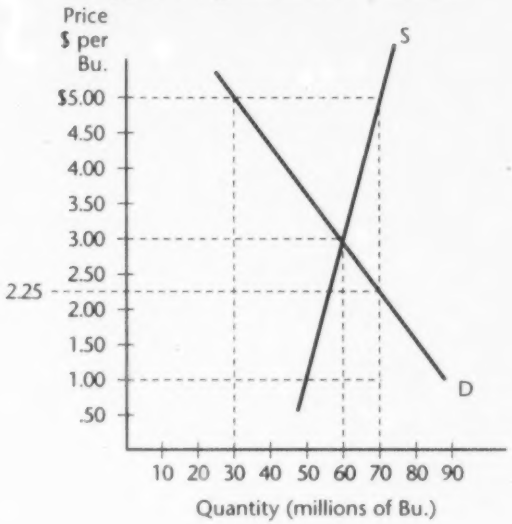
ACTIVITY 28
Farm Price Supports

Below are two different diagrams of the market for a "typical" agricultural product. Study both diagrams, and use them to answer the questions that follow. Fill in the answer blanks or cross out the incorrect words in parentheses.

Case A:
A Typical Agricultural Product



Case B:
A Typical Agricultural Product



1. Under free market conditions, the equilibrium price in both Case A and Case B would be $_____ per bushel, people would buy and consume _____ million bushels, and total farm revenue would be $ _____ million.

Now assume the government decides farmers should receive $5.00 (not $3.00) per bushel for this product. There are at least three different policies that the government could adopt to achieve this objective. Each of these polices is explained. Study these explanations, and use the diagrams above to analyze the effects of each policy in both Case A and Case B.

Policy 1: Crop Restriction Program

2. Suppose the government can persuade farmers to reduce the supply (shift the whole supply curve to the left) to the extent that a new market equilibrium price of $5.00 per bushel is established. Under this program:

   a. In Case A people would buy and consume _____ million bushels, and total farm revenue would be $ _____ million.

   b. In Case B people would buy and consume _____ million bushels, and total farm revenue would be $ _____ million.

   If no taxpayers' money is used to persuade (or "bribe") farmers to restrict their supply, we can assume that the total cost of this program to taxpayers, *per se*, would be zero. (not likely)

Adapted from Phillip Saunders, *Introduction to Microeconomics: Student Workbook*, Fifteenth edition, Bloomington, IN, 1993.
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ACTIVITY 28 continued

Policy 2: Loan-Storage Program

3. Suppose the government tells farmers it will "lend" them $5.00 a bushel for this product. They can sell as much of their output as they want on the open market at $5.00 a bushel, and repay the government in cash; but if they have some output that they can't sell at this price, they can give the product itself to the government in repayment for their loans and the government will store the surplus. (NOTE: In effect, this says, "Grow all you can profitably produce at $5.00 a bushel and sell as much of it as you can to the public at that price. The government will then use tax dollars to purchase all leftovers at $5.00 a bushel.") Under this program:

   a. In Case A people would buy and consume _____ million bushels and they would pay farmers a total of $ _____ million. Further, the government would buy and store _____ million bushels at a cost to the taxpayer of $ _____ million (not counting storage cost), and total farm revenue would be $ _____ million.

   b. In Case B people would buy and consume _____ million bushels and they would pay farmers a total of $ _____ million. Further, the government would buy and store _____ million bushels at a cost to the taxpayer of $ _____ million (not counting storage cost), and total farm revenue would be $ _____ million.

Policy 3: Direct Payment Plan

4. Suppose the government tells farmers, "We will guarantee you $5.00 a bushel, but everything you produce at this price must be sold on the open market for whatever buyers will pay for this quantity; then we will give you, at taxpayers' expense, the difference between the price that buyers pay and $5.00 a bushel."

   a. In Case A people would buy and consume _____ million bushels, and they would pay farmers a total of $ _____ million. Further, the government would use taxpayers' money to pay the farmers another $ _____ million, and total farm revenue would be $ _____ million.

   b. In Case B people would buy and consume _____ million bushels, and they would pay farmers a total of $ _____ million. Further, the government would use taxpayers' money to pay the farmers another $ _____ million, and total farm revenue would be $ _____ million

5. If your goal was minimum cost to taxpayers (ignoring storage cost or "bribes" to get crop restriction), which of these programs would you favor?

   a. In Case A? *(crop restriction/loan storage/direct payment)* Why?

   b. In Case B? *(crop restriction/loan storage/direct payment)* Why?

ACTIVITY 28 continued

6. If your goal was maximum food consumption by the people, which of these programs would you favor?

   a. In Case A? *(crop restriction/loan storage/direct payment)* Why?

   b. In Case B? *(crop restriction/loan storage/direct payment)* Why?

7. What is the main difference between the economic situation in Case A and Case B?

8. Do you think that the price elasticity of demand for most agricultural products in the real world is relatively elastic or relatively inelastic? Do you think there might be a difference in the price elasticity of demand for a single agricultural product and for all agricultural products as a group? Why?

ACTIVITY 29
Pricing Problems

For each of these situations, give an answer of one or two sentences. Then support that answer with sound economic reasoning. In most cases, it would help to use a graph to illustrate your answer.

1. "Gold is valuable because so many people hunt for it." True, false, or uncertain? Why?

2. A consumer group believes the prices of necessities such as food, housing, energy, and medical care should be controlled by the government. "People can afford higher prices for luxuries," they reason, "but all of us, and especially the poor, suffer when the prices of necessities rise." Evaluate the effects of this plan.

3. State Representative Smith feels that New York can raise revenue by increasing license plate and registration fees 500%. With five times the revenue, the state can solve a lot of problems. Is he right? Why or why not?

4. Make the optimistic assumption that one day you will be a college graduate. Would you support a law to raise the legal minimum wage of college graduates to $50,000?

5. Recently the price of beef rose. By drawing graphs, show that the rise in price could be consistent with the following:
   a. The quantity of beef consumed falling.
   b. The quantity of beef consumed rising.
   c. The quantity of beef consumed staying the same.

   Be sure to draw a graph for each situation and provide a brief explanation of each situation.

Exercise developed by John Morton.

ACTIVITY 29 continued

6. A lobbyist for the Dairy Association of America is asked to comment on how the elimination of the government's milk price-support program would affect the price of milk. Her statement follows:

   > The elimination of price supports would, in our opinion, result in an increase in milk prices within 2 months. Certainly, the immediate effect would be to reduce prices. But as prices fall, demand would increase. We believe this increase in demand would be so strong that within 2 months prices would be higher.

   Comment on the lobbyist's argument.

7. Recently the Franklins asked a realtor to show them houses for sale in their town. The Franklins bought a house that the realtor showed them. They complained to the realtor after purchasing the house, "We can't understand why realtors get 6% of the purchase price as a fee. All you did was drive us to a few houses and show us around. It's outrageous!" Comment on the Franklins' complaint.

8. Illustrate the following situations on a graph:
   a. The legalization of narcotics.
   b. The U.S. government purchased the entire cocaine supply in Colombia.
   c. Enforcement of drug laws is aimed at pushers.
   d. Enforcement of drug laws is aimed at users.

   Be sure to explain your graphs.

9. You learn that a prominent economist is going to give a lecture and you rush to get tickets. The economist says, "We economists don't know much, but we know how to create shortages and surpluses."
   a. How can government create a shortage in a competitive market? Illustrate this with a graph. Can you provide examples of this?
   b. How can government produce a surplus in a competitive market? Illustrate this with a graph. Can you provide examples of this?

Sample Multiple-Choice Questions

Circle the letter of each correct answer.

1. A downward sloping demand curve can be explained by:
   I. Diminishing marginal utility.
   II. Diminishing marginal returns.
   III. The income effect.

   a. I only
   b. II only
   c. III only
   d. I and III only
   e. I, II, and III

2. Which of the following is true when a demand schedule is drawn on a graph?
   I. Price is measured on the vertical axis.
   II. The demand curve has a negative slope.
   III. All other variables except price are held constant.

   a. I only
   b. II only
   c. III only
   d. I and II only
   e. I, II, and III

3. If there is an increase in demand, what will happen to the price and quantity of the good exchanged?

	Price	Quantity
a.	Increase	Decrease
b.	Increase	Increase
c.	Decrease	Increase
d.	Decrease	Decrease
e.	No change	No change

4. An upward sloping supply curve can be explained by the fact that:
   I. Higher prices mean greater profits for a producer.
   II. Eventually costs rise as production increases.
   III. Consumers find goods more valuable at higher prices.

   a. I only
   b. II only
   c. III only
   d. I and II only
   e. I, II, and III

5. What effect would a decrease in the price of silicon chips and a greater production of user-friendly software have on the price and quantity of computers?

	Price	Quantity
a.	Increase	Decrease
b.	Increase	Increase
c.	Decrease	Cannot be determined
d.	Cannot be determined	Increase
e.	Decrease	Decrease

6. An increase in the price of gasoline shifts the demand for tires in which direction?
   a. To the left, because gasoline and tires are substitutes.
   b. To the left, because gasoline and tires are normally used together.
   c. To the right, because gasoline and tires are substitutes.
   d. To the right, because gasoline and tires are normally used together.
   e. To the right, because an increase in the price of gasoline makes consumers poorer and thus not willing to pay as much for tires.

SAMPLE MULTIPLE-CHOICE QUESTIONS continued

7. The price of coal fell and the quantity sold also fell. Which of the following events is consistent with this observation (everything else equal)?
   a. The price of oil fell.
   b. Large wage increase to coal miners.
   c. Installation of more efficient coal mining equipment.
   d. Consumer incomes rose.
   e. The demand curve was inelastic.

8. During a football game, it starts to rain and the temperature drops. The senior class, which runs the concession stand and is studying economics, raises the price of coffee from 50 cents to 75 cents per cup. They sell more than ever before. Which answer explains this?
   a. The supply of coffee increased.
   b. The demand curve for coffee was elastic.
   c. The supply of coffee decreased.
   d. The demand for coffee increased.
   e. The demand curve for coffee was inelastic.

9. The term "diminishing marginal utility," as used in explaining downward sloping demand curves, other things constant, is best described by which of the following statements?
   a. As you consume more of a good, the total satisfaction you obtain from consuming this good tends to fall.
   b. As you consume more of a good, the average satisfaction you obtain from each unit of this good tends to fall.
   c. As you consume more of a good, the extra or additional satisfaction you obtain from each extra or additional unit of this good consumed tends to fall.
   d. As you consume more of a good, your satisfaction tends to diminish in inverse proportion to the increase in the price of the good consumed.
   e. As you consume more of a good, the total satisfaction you obtain from the good tends to rise.

10. Four of the five events described below might reasonably be expected to shift the demand curve for beef to a new position. One would *not* shift that demand curve. Which is the single exception?
    a. A fall in the price of beef.
    b. A change in people's tastes with respect to beef.
    c. An increase in the money incomes of beef consumers.
    d. A widespread advertising campaign undertaken by the producers of a product competitive with beef, such as pork.
    e. Expectations that beef prices will fall in the future.

11. What will happen if a legal price floor is placed on a good below its free market equilibrium price?
    a. Surpluses will develop.
    b. Shortages will develop.
    c. Black markets will develop.
    d. The equilibrium price will ration the good.
    e. Both b and c will occur.

12. If the price of lunch at the school cafeteria increases and revenues of the cafeteria remain constant, we can conclude that the elasticity of demand for a school lunch is:
    a. Elastic.
    b. Perfectly elastic.
    c. Unit elastic.
    d. Inelastic.
    e. Perfectly inelastic.

SAMPLE MULTIPLE-CHOICE QUESTIONS continued

13. This question is based on the following data:

Year	Quantity sold	Price
1994	30,000	$10
1995	50,000	$20

Which of the following statements is/are true?

I. Demand has increased.
II. Quantity demanded has increased.
III. Supply has increased.
IV. Quantity supplied has increased.
V. Supply has decreased.

a. I only
b. V only
c. I and IV only
d. I and V only
e. I, II, and III only

14. During the depression of the 1930s, the price of radios fell by about 30 percent and the quantity sold decreased by about the same amount. This indicates that the demand for radios:
a. Was elastic.
b. Was inelastic.
c. Was of unitary elasticity.
d. Must have shifted to the left.
e. Must have shifted to the right.

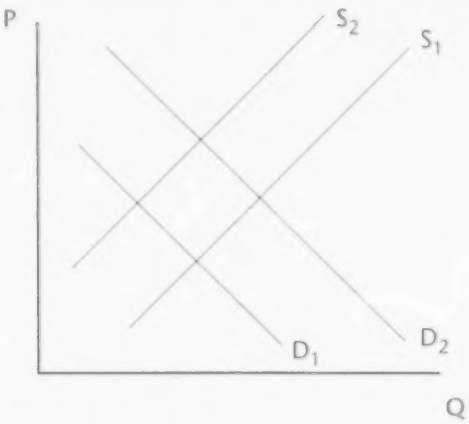
15. If the price of videotapes decreases and consumer expenditures on videotapes also decrease, we can conclude that:
a. The demand for videotapes is inelastic.
b. The demand for videotapes is elastic.
c. The demand for videotapes is unit elastic.
d. Videotapes are inferior goods.
e. Videotapes are normal goods.

16. What will happen to the price and quantity of pizzas if a new study shows pizza is the ultimate health food?

	Price	Quantity
a.	Increase	Increase
b.	Increase	Decrease
c.	Decrease	No change
d.	Decrease	Increase
e.	Decrease	Decrease

17. A marketing survey shows that gate receipts (total ticket revenue) would increase if the price of tickets to Chicago Bulls games increased even though the number of tickets sold would fall. What does this imply about the price elasticity of demand for Bulls tickets?
a. Demand is elastic.
b. Demand is inelastic.
c. Demand is unit elastic.
d. Demand is perfectly inelastic.
e. Demand is perfectly elastic.

SAMPLE MULTIPLE-CHOICE QUESTIONS continued

18. 

In the diagram above, D_1 and S_1 represent the initial demand and supply curves for orange juice. Which of the following would explain the shift in the demand curve to D_2 and the shift in the supply curve to S_2?

a. There has been a poor orange harvest, and medical research has determined that orange juice is a prime cause of acne.
b. Consumer incomes have increased, and many orange groves are being sold to condominium developers.
c. The price of grapefruit juice has fallen, and the government has lifted its restrictions on importing oranges from Mexico.
d. Farmers have switched to growing oranges that are less susceptible to disease, and consumers have stopped drinking orange juice at lunch and dinner.
e. Producers have found an inexpensive way of extracting more juice from oranges, and the wages of farm workers have risen.

19. For which of the following elasticities will an increase in price cause a decrease in total revenue?

I. 1.6
II. 0.8
III. 0.6

a. I only
b. II only
c. III only
d. I and II only
e. II and III only

20. Which of the following statements is/are true?

I. A price ceiling causes a shortage if the ceiling price is below the equilibrium price.
II. A price floor causes a surplus if the price floor is above the equilibrium price.
III. A price ceiling causes a shortage if the ceiling price is above the equilibrium price.
IV. A price floor causes a surplus if the price floor is below the equilibrium price.

a. I only
b. II only
c. III only
d. I and II only
e. III and IV only

Sample Short Essay Questions

*1. The demand and supply of cigarettes are depicted in the diagram above.
   a. Use supply-and-demand analysis to describe the impact of a per-unit tax on each of the following:
      i. The price paid by consumers for cigarettes.
      ii. The quantity of cigarettes sold.
   b. If the demand for cigarettes becomes more elastic, explain how each of the following will differ from Part A.
      i. The price and quantity sold of cigarettes.
      ii. The government's tax revenues.

2. Evaluate this statement: "An increase in demand increases price. The higher price increases supply. The higher supply decreases price, and price settles down to the original level."

3. In a recent year, the price of diamonds increased. Show that this is consistent with the following:
   a. The quantity of diamonds rising.
   b. The quantity of diamonds falling.
   c. The quantity of diamonds staying the same.

4. If foreigners demand more American wheat, what will happen to the price and quantity supplied in the momentary situation? In the short run? In the long run? Why?

5. I sit in the back row at the local meeting of the barbers' union where they are discussing a proposal to raise the price of haircuts from $10 to $12. The argument gets nowhere, and someone suggests asking me, as an economist, whether it is a good idea or not. I reply, "Many studies have shown that the demand for haircuts is elastic." What are they to make of that? Why? Be as brief as possible in making the big main point that the barbers ought to see in this situation.

6. True, false, or uncertain, and why? "Other things being the same, the surplus of workers associated with a price floor will be greater the greater the elasticity of both supply and demand." Discuss this statement. Use graphs to illustrate your explanation.

*Actual AP essay question from a past year

Sample Long Essay Questions

1. You are a member of the city council and are considering a law to control rents below the free market rent.
   a. What would be the effect of this rent control law in the short run?
   b. What would be the effect of this rent control law in the long run?
   Be sure to explain why you think these effects will occur. Use a graph in your explanation. Tell how you would vote and why.

*2. In a perfectly competitive market in long-run equilibrium, what would be the immediate results of imposing and enforcing a price ceiling below the equilibrium price of the product? What would be the long-run effect of continuing to enforce the ceiling price assuming black markets don't develop? Be sure to explain why the predicted effects will occur.

*3. Assume the market for unskilled workers is perfectly competitive and in equilibrium. Then a minimum wage is imposed which increases the wage rate of unskilled workers.
   a. Use supply-and-demand analysis to explain how this increase in the wage rate will affect each of the following:
      i. The number of workers employed in the market.
      ii. The number of unskilled workers seeking employment in the market.
   b. Assume that the fast food industry is perfectly competitive and employs only one factor of production, unskilled workers. Use supply-and-demand analysis to explain how the increase in the wage rate resulting from the imposition of the minimum wage will affect each of the following in the fast food industry in the short run.
      i. Price of fast food.
      ii. Quantity of fast food produced.

*Actual AP essay question from a past year

Microeconomics

Unit 3

The Theory of the Firm

Key Ideas

- All firms have costs. It is important to be able to define and plot graphically these major costs.
- Explicit costs are monetary payments a firm must make to an outsider to obtain a resource.
- Implicit costs are income a firm sacrifices when it employs a resource it owns to produce a product rather than to sell the resource to someone else.
- Fixed costs do not change with output. There are fixed costs only in the short run. The long run is defined as a period in which there are no fixed costs and firms are free to allocate their resources as they please.
- Variable costs change with output.
- Total costs equal fixed costs plus variable costs.
- Marginal cost is the additional cost of producing an additional unit of output. Marginal cost is very important in determining at what price and output a firm will operate.
- Marginal cost eventually rises because of the law of diminishing marginal returns. The law of diminishing marginal returns is based on evidence that marginal product declines when equal amounts of a variable factor of production are added to fixed factors of production.
- Average total cost and average variable cost are total cost and variable cost divided by output.
- Average total cost and average variable cost fall when marginal cost is below them and rise when marginal cost is above them.
- The marginal cost curve crosses the average variable cost curve and the average total cost curve at their lowest points.
- If a firm has revenues that cover all its costs, it breaks even.
- If a firm has more revenues than costs, it makes a profit.
- If a firm has less revenues than costs, it operates at a loss.
- In the long run, a firm must cover all its implicit and explicit costs, including a normal rate of profit.
- In the short run, a firm can operate at a loss as long as its revenue covers its variable costs.
- Economic profits are profits over and above the normal rate of profit in which a firm just covers its costs. A firm makes an accounting profit when its revenue exceeds its explicit costs. A firm makes an economic profit if it more than covers both its explicit and implicit costs.
- The object of a firm is to maximize profits and/or minimize loss.
- Firms maximize profits when they produce where marginal revenue equals marginal cost.
- Perfect competition exists when many firms produce a homogeneous product.
- For a perfectly competitive firm, marginal revenue is equal to price. A perfectly competitive firm produces where price equals marginal cost. A perfectly competitive firm breaks even in the long run.
- A monopoly occurs when one firms controls the market.
- Other things being constant, the most efficient allocation of resources occurs when a firm produces at the level of output where price (measuring marginal benefits to buyers) is equal to marginal cost.
- In the long run, a perfectly competitive firm produces at an output where price equals marginal cost and also produces where average total cost reaches its lowest point. A perfectly competitive firm is allocatively and productively efficient in the long run.
- For a monopoly firm or any firm under imperfect competition, marginal revenue is less than price.
- A monopoly firm maximizes profits when marginal revenue equals marginal cost.
- A monopoly can make economic profits in the long run. However, a long-run economic profit is not guaranteed.
- In the long run, a monopoly firm charges a higher price and produces at a lower output than a perfectly competitive firm.
- A monopoly firm will operate where price is greater than marginal cost, causing a misallocation of resources.
- Oligopoly occurs when a few firms control the market.
- Monopolistic competition is close to pure or perfect competition except that there is product differentiation.

ACTIVITY 30

Different Types of Market Structure

After you have learned about the four types of market structure, complete the chart below.

Types of Market Structure

Market Structure	Number of Firms	Differentiated or Homogeneous Product	Ease of Entry	Price-Setting Power	Non-Price Competition	Examples
Perfect Competition						
Monopolistic Competiton						
Oligopoly						
Monopoly						

ACTIVITY 31
Costs of the Individual Firm

Part A.
Fill in the blanks and answer the questions.

1. M.I. Fortunate was employed as plant manager for a corporation at a salary of $50,000 a year, and she had savings of $100,000 invested in securities that yielded an eight percent annual income. She went into business for herself, investing all her savings in the enterprise. At the end of the first year, her accounts showed a net income of $55,000 after all expenses of operation. One accountant said this accounting profit represented a 55 percent return on her $100,000 investment. Another accountant, who had taken introductory microeconomics, said, "No, you should pay yourself the $50,000 salary you would have earned anyway, and your accounting profit of $5,000 represents a return of five percent on your investment of $100,000." A serious student of introductory microeconomics, however, should say, "No, your true economic profit from going into business for yourself is $ _____, and this is a return of _____ percent." Was M.I. Fortunate, fortunate? Yes or No and why?

2. The table *Aggregate and Unit Cost Structure* on the following page shows a comprehensive set of cost data for a firm, with a given plant, at various levels of output. Study this table to understand how it is set up.

   Marginal cost is the *additional* cost of producing an *additional* unit of output ($\Delta C/\Delta Q$). If producing an additional 100 units of output adds $700 to total cost, the marginal cost per unit is $700/100 = $7.00, etc. Note that in the table the "marginal" changes are located between output levels.

   After you have filled in the blanks in the table, finish plotting the aggregate cost data for fixed cost, variable cost, and total cost (*not* change in total cost) on the *Graph of Aggregate Cost Data* provided on page 113. Also, finish plotting the unit cost data for FC/Q, VC/Q, TC/Q and $\Delta TC/\Delta Q$ on the *Graph of Unit Cost Data* provided on page 114. Note that marginal cost ($\Delta TC/\Delta Q$) is plotted midway between the levels of output given in first column of the table *Aggregate and Unit Cost Structure*.

3. After you have finished plotting, answer the eight questions that follow in Part B.

Adapted from Phillip Saunders, *Introduction to Microeconomics: Student Workbook*, Fifteenth edition, Bloomington, IN, 1993.
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ACTIVITY 31 continued

Aggregate and Unit Cost Structure

Aggregate Cost Data					Unit Cost Data				
Quantity of Output	Fixed Cost (FC)	Variable Cost (VC)	Total Cost (TC)	Change in Total Cost (ΔTC)	Average Fixed Cost FC/Q	Average Variable Cost VC/Q	Average Total Cost TC/Q	Marginal Cost ΔTC/ΔQ	Plot MC at Output
0	$500	$0	$500		XXX	XXX	XXX	XXX	
				$700				$7.00	50
100	500	700	1200		$5.00	$7.00	$12.00		
				600				6.00	150
200	500	1300	____		2.50	6.50	9.00		
				500				5.00	250
300	____	____	2300		1.67	6.00	____		
				____				7.00	350
400	____	2500	____		1.25	6.25	7.50		
				800				8.00	450
500	500	3300	3800		____	6.60	____		
				____				____	550
600	500	4300	4800		.83	7.17	8.00		
				____				12.00	650
700	____	5500	6000		.71	7.86	____		

Part B.
Plot the appropriate data from the table on the graphs *Aggregate Cost Data* and *Unit Cost Data* on pages 113 and 114 before answering the eight questions that follow.

1. How is marginal cost (ΔTC/ΔQ) represented in your graph *Aggregate Cost Data*?

2. On your graph *Unit Cost Data*, total cost per unit (TC/Q or average total cost) is at a minimum at an output level of _____ units.

3. On your graph *Unit Cost Data*, variable cost per unit (VC/Q or average variable cost) is at a minimum at an output level of _____ units.

4. On your graph *Unit Cost Data*, what is the relation between marginal cost (ΔTC/ΔQ) and average total cost (TC/Q) when average total cost is at its minimum?

5. On your graph what is the relation between marginal cost (ΔTC/ΔQ) and average variable cost (VC/Q) when average variable cost is at its minimum?

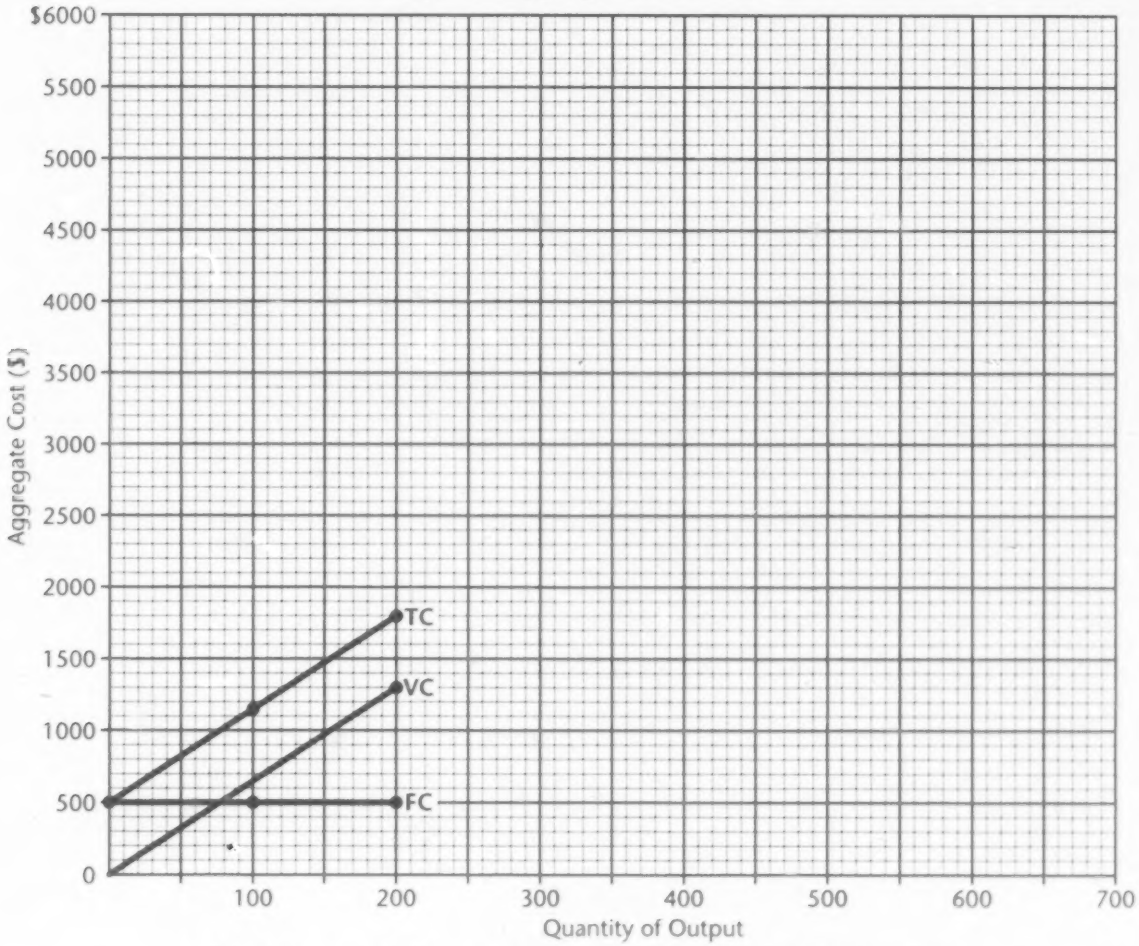
6. Explain why marginal cost on a unit cost graph always intersects average total cost and average variable cost at their minimum points.

ACTIVITY 31 continued

7. On your graph *Unit Cost Data,* what does the vertical distance between the TC/Q curve and VC/Q curve represent?

8. Explain why fixed cost has no influence on marginal cost.

Graph of Aggregate Cost Data

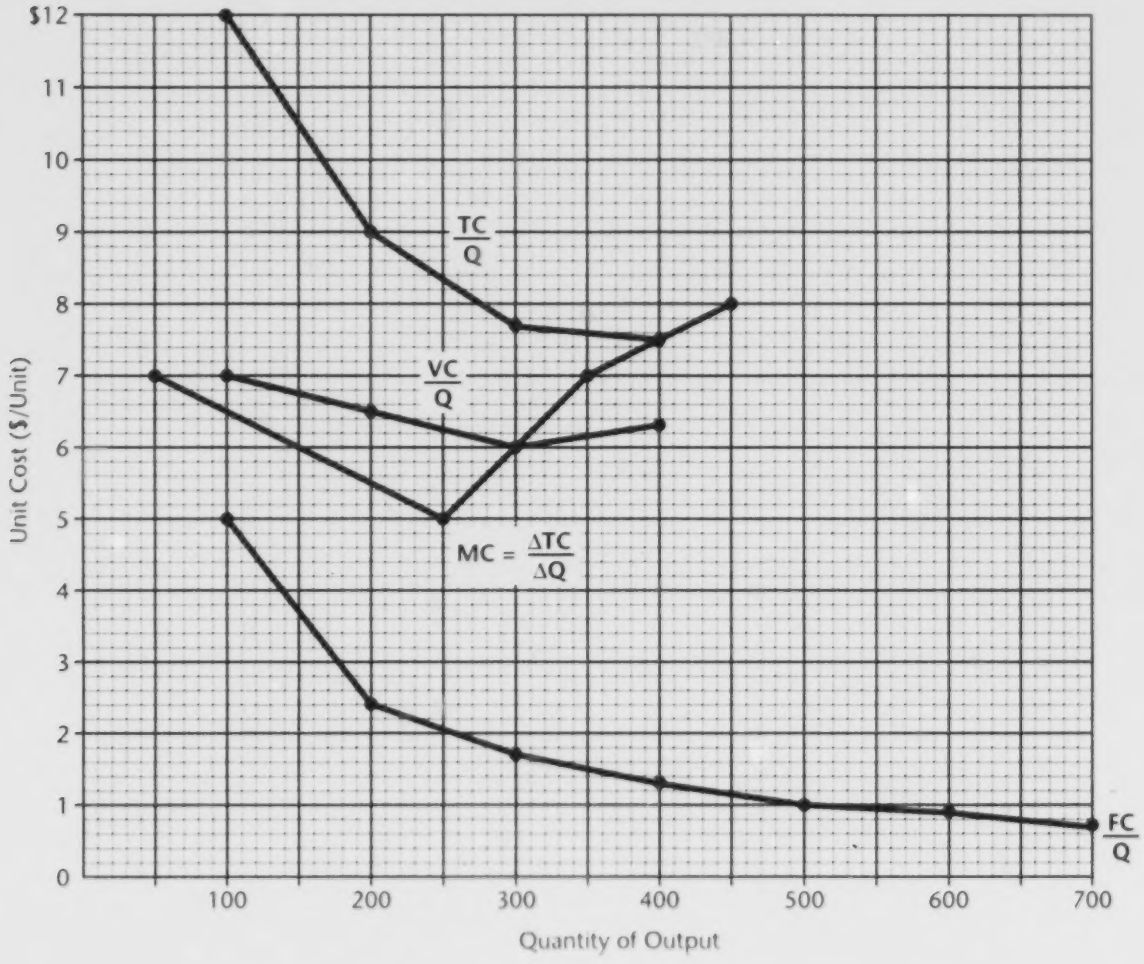


Note: Each small square = $100 on the vertical axis and 10 units of output on the horizontal axis

ACTIVITY 31 continued

Graph of Unit Cost Data

Marginal cost ($\Delta TC/\Delta Q$) is plotted between the output levels shown in the table *Aggregate and Unit Cost Structure* on page 112.



Note: Each small square = $.20 on the vertical axis and 10 units of output on the horizontal axis.

ACTIVITY 32

An Introduction to Perfect Competition

This activity explains how businesses operate and how their operation affects society. To accomplish the explanation, it is necessary to look at business costs and revenues. This analysis is based on the assumption that the object of any business is to maximize profits.

Part A. Definitions of Costs.
Define on this sheet the following terms.

1. Average fixed cost (AFC)
2. Average total cost (ATC)
3. Average variable cost (AVC)
4. Economic cost
5. Economic profit
6. Explicit cost
7. Fixed cost (FC)
8. Implicit cost
9. Law of diminishing marginal returns
10. Long run
11. Marginal cost (MC)
12. Normal profit
13. Short run
14. Total cost (TC)
15. Variable cost (VC)

ACTIVITY 32 continued

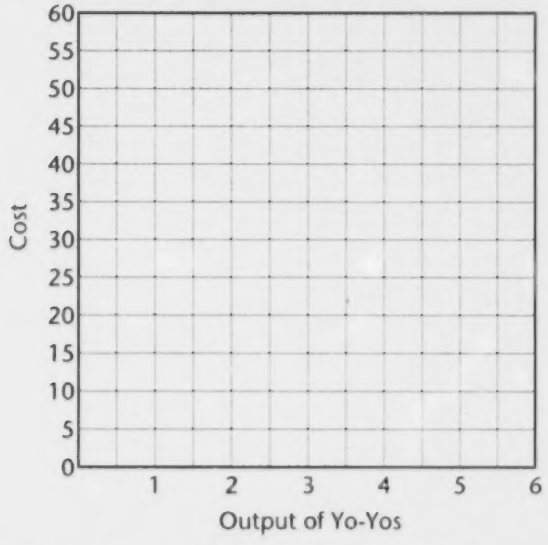
Part B. Marginal Cost Problem.
Fill in the blanks.

Output, Total Cost, and Marginal Cost

Output	Total Cost (TC)	Marginal Cost (MC)
0	55	
1	85	_____
2	110	_____
3	130	_____
4	160	_____
5	210	_____

Part C. Graphing Problem.
Graph these marginal costs on the graph *Plotting Marginal Cost of Yo-Yos*. MC is on the vertical axis, and output of yo-yos is on the horizontal axis. Plot MC between output levels.

Plotting Marginal Cost of Yo-Yos



1. What is the relationship between MC and output as shown on your graph?

2. Explain why MC falls and then rises as output increases.

ACTIVITY 32 continued

Part D. Charting and Graphing Costs.
Complete the chart *Fixed and Variable Costs of Yo-Yos*. Assume that the firm has a total fixed cost (FC) of $60 and total variable costs (VC) as shown below. Part of the chart has been completed for you.

Fixed and Variable Costs of Yo-Yos

Total Product	FC	VC	TC	MC	AFC	AVC	ATC
0	$60	0	$60		---	---	---
				$45			
1	$60	$45	$105		$60.00	$45.00	$105.00
				$40			
2	$60	$85	$145		$30.00	$42.50	$72.50
				____			
3	____	$120	____		____	____	____
				____			
4	____	$150	____		____	____	____
				____			
5	____	$185	____		____	____	____
				____			
6	____	$225	____		____	____	____
				____			
7	____	$270	____		____	____	____
				____			
8	____	$325	____		____	____	____
				____			
9	____	$390	____		____	____	____
				____			
10	____	$465	____		____	____	____

1. Graph FC, VC, and TC on the graph *Total Variable, Total Fixed, and Total Costs*, on page 121. Graph all three cost curves on one graph. Cost is on the vertical axis, and output of yo-yos is on the horizontal axis. Label each curve.

   a. What is the difference between fixed and total costs?

   b. Why does VC rise as output increases?

   c. Why is FC a horizontal line?

   d. Why does the TC curve have the same slope as the VC curve?

ACTIVITY 32 continued

2. Graph AFC, AVC, ATC, and MC on the graph *Plotting Average Fixed, Average Variable, Average Total and Marginal Costs* on page 122. Graph all four cost curves on one graph. Cost is on the vertical axis, and output of yo-yos is on the horizontal axis. Label each cost curve.

   a. What happens to AFC as output rises? Why?

   b. What happens to AVC as output rises? Why?

   c. What happens to ATC as output rises? Why?

   d. What happens to MC as output rises? Why?

   e. At what unique point does marginal cost cross AVC and ATC? Why?

   f. Why is MC the same whether computed from TC or VC?

ACTIVITY 32 continued

Part E. Definitions of Revenue.
Define on this sheet the following terms.

1. Total revenue (TR)

2. Marginal revenue (MR)

3. Average revenue (AR)

Part F. Marginal Revenue Problem.
The following is a revenue schedule for a perfectly competitive firm. Fill in the blanks.

Revenue Schedule for a Perfectly Competitive Firm

Price	Quantity	TR	MR
$10	1	$10	
			$10
$10	2	$20	
			____
$10	3	$30	
			____
$10	4	____	

1. What generalization can you make about price and marginal revenue under perfect competition?

2. Why doesn't the perfect competitor lower the price to sell more?

3. What determines the price at which the perfect competitor sells the product?

ACTIVITY 32 continued

Part G. Pricing under Perfect Competition.

1. Graph prices of $32, $45, and $56 on the graph *Plotting Average Fixed, Average Variable, Average Total and Marginal Costs* on page 122. (Hint: Each price is a horizontal line.)

2. At a price of $56:
   a. How many yo-yos will the firm product in the short run? _____ Why? (NOTE: Assume you can produce part of a yo-yo.)

   b. Will the firm earn an economic profit or have an economic loss? _____
   How much will the approximate profit or loss per unit be? _____
   How much will the approximate total profit or loss be? _____

3. At a price of $45:
   a. How many yo-yos will the firm produce in the short run? _____ Why?

   b. Will the firm earn an economic profit or have an economic loss? _____
   How much will the approximate profit or loss per unit be? _____
   How much will the approximate total profit or loss be? _____

   c. Will this yo-yo firm stay open or shut down in the short run? _____
   Why?

4. At a price of $32:
   a. How many yo-yos will this firm produce in the short run? _____ Why?

   b. Will this firm stay open or shut down in the short run? _____ Why?

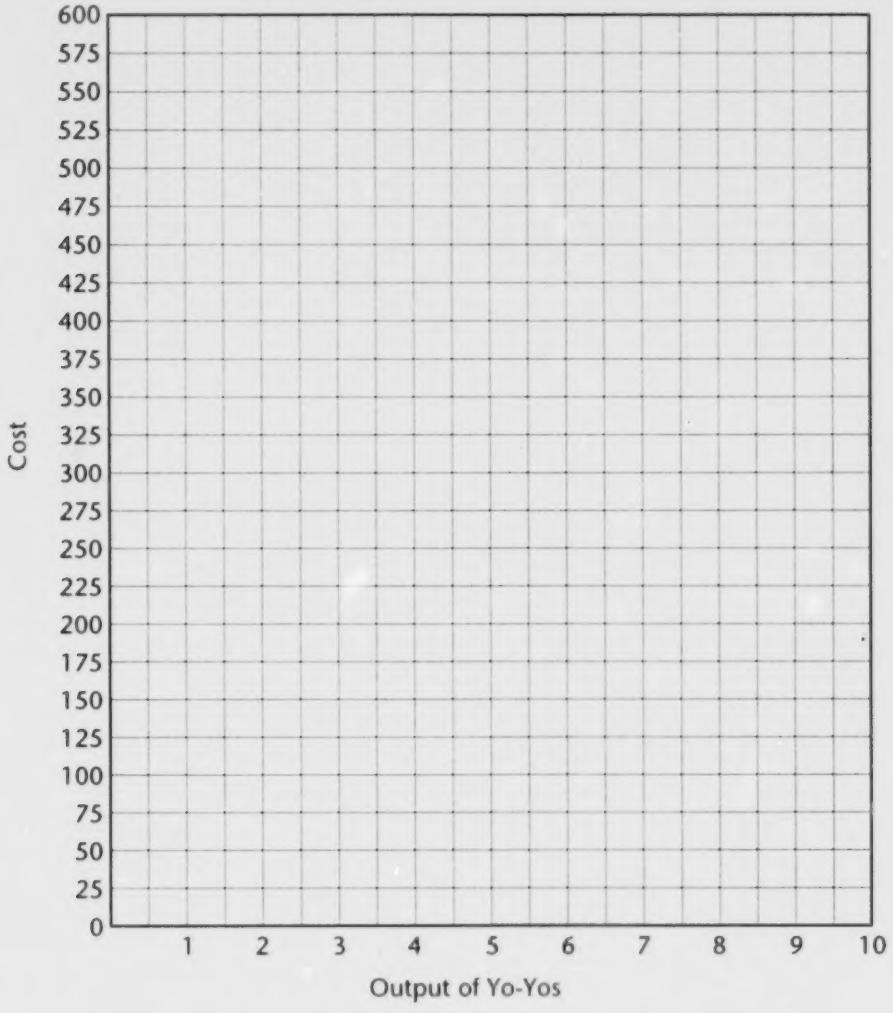
5. Why will a firm maximize its profits or minimize its losses at the output where MR (price) equals MC?

6. Why are price and MR the same for a perfect competitor?

7. Why is a perfect competitor called a "price taker"?

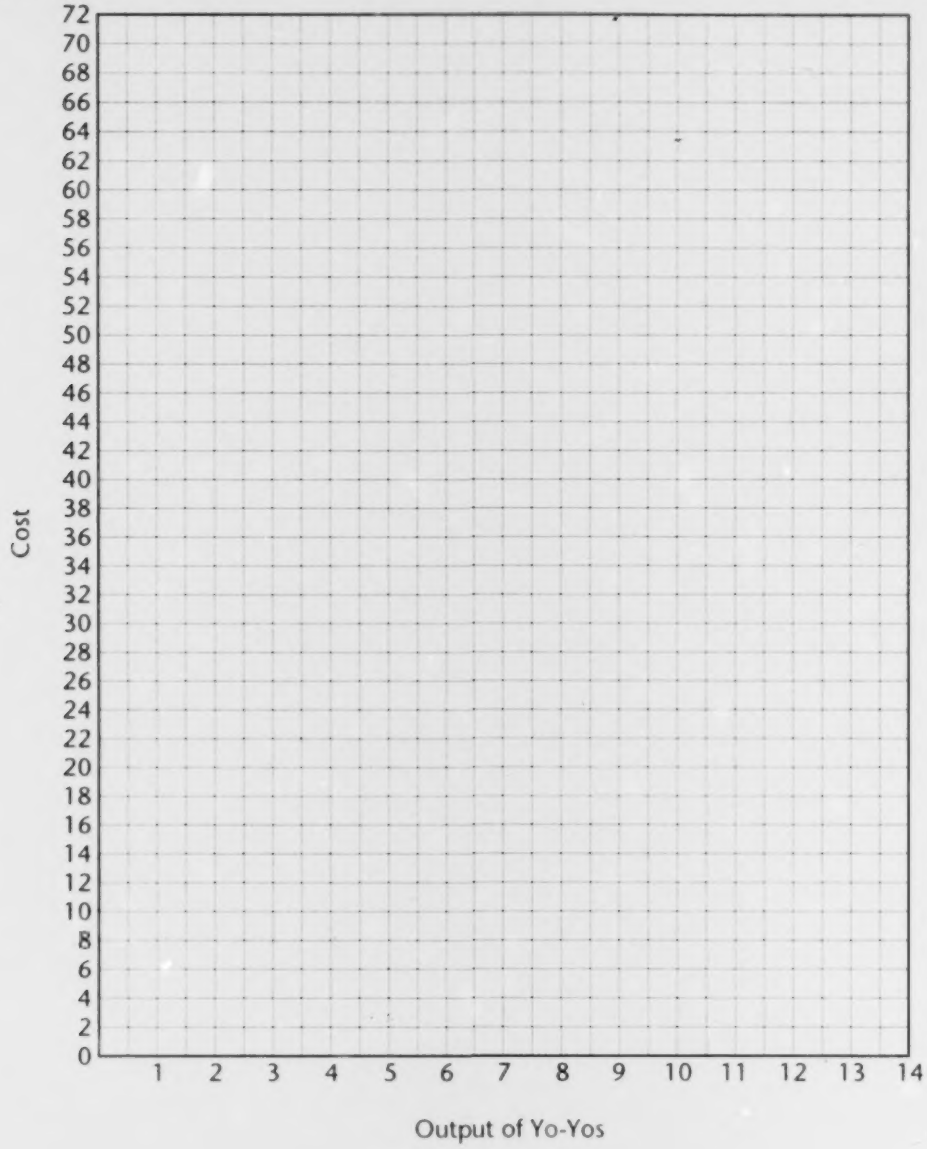
ACTIVITY 32 continued

Total Variable, Total Fixed, and Total Costs

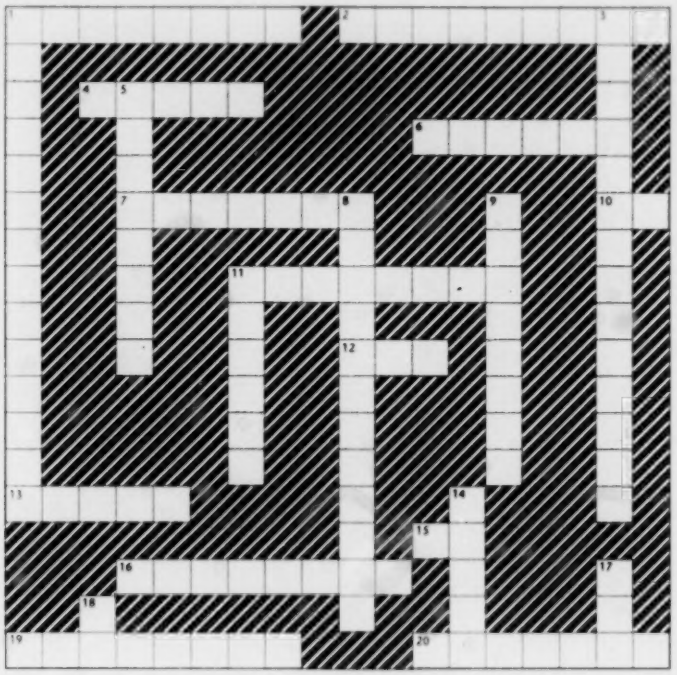


ACTIVITY 32 continued

Plotting Average Fixed, Average Variable, Average Total and Marginal Costs



ACTIVITY 33
Market Structure Crossword Puzzle



Across

1. Another name for accounting costs
2. Market structure in which there are only a few producers
4. A cost that does not change as production increases or decreases
6. The amount consumers are willing and able to buy at each price per unit of time
7. The time period during which the size of the plant may be altered and all costs are variable (2 words)
10. The change in the total cost due to a change of one unit of production (abbr.)
11. The time period in which a firm cannot alter its plant size (2 words)
12. Total variable costs divided by the number of units produced (abbr.)
13. Fixed cost and variable cost together
15. Total revenue divided by the total number of units produced (abbr.)
16. Any goods that are scarce
19. Costs that increase and/or decrease with changes in production
20. Market structure in which the decisions of individual buyers and sellers have no effect on the market price because there are so many of each

Down

1. Revenue remaining after all implicit and explicit costs have been paid (2 words)
3. When one additional unit of input produces less output than the previous unit of input, the _____ of _____ returns has taken effect. (2 words)
5. The costs of owner-provided capital and labor
8. What an entrepreneur obtains when just meeting the explicit and implicit costs (2 words)
9. Market with only one firm
11. The amount producers are willing and able to provide at each price level per unit of time
14. The firm operating in perfect competition is called a _____ taker.
17. Total cost divided by the number of units produced (abbr.)
18. The change in total revenue by the production and sale of one unit of the product (abbr.)

Activity developed by Jerry DeYoung, Riverbank High School, Riverbank, CA, and Ken Hill, Hanford Joint Union High School, Hanford, CA.

ACTIVITY 34

Costs and Competitive Market Supply (Perfect Competition)

Part A. One Firm in the Short Run

1. The Fiasco Company is a perfectly competitive firm whose daily costs of production (including a "normal" rate of profit) in the short run are as follows:

The Fiasco Company's Cost Table

Output (Per day)	Variable Cost	Total Cost	Marginal Cost	Average Total Cost	Average Variable Cost
0	0	12.00	XXXX	XXXX	XXXX
			4.00		
1	4.00	16.00		16.00	4.00
			3.00		
2	7.00	19.00		9.50	3.50
			____		
3	9.00	21.00		7.00	3.00
			____		
4	13.00	25.00		____	3.25
			____		
5	19.00	____		____	____
			____		
6	27.00	____		____	____
			____		
7	37.00	____		____	5.29
			____		
8	49.00	____		7.63	6.13
			____		
9	63.00	____		8.33	____
			16.00		
10	79.00	91.00		9.10	____

a. Fill in the blanks in *The Fiasco Company's Cost Table*. Note that marginal cost is shown between levels of output.

b. On the graph *The Fiasco Company's Cost Curve*, plot and label the average variable cost (AVC), average total cost (ATC), and marginal cost (MC) curves. Assume that this firm can produce any fraction of output per day so that you connect the points to form continuous curves. NOTE: To be absolutely precise, the marginal cost (MC) curve should be plotted midway between the output intervals. (See helpful start on the graph.)

c. How would you interpret the vertical distance between the average total cost and average variable cost curves?

Adapted from Phillip Saunders, *Introduction to Microeconomics: Student Workbook*, Fifteenth edition, Bloomington, IN, 1993.
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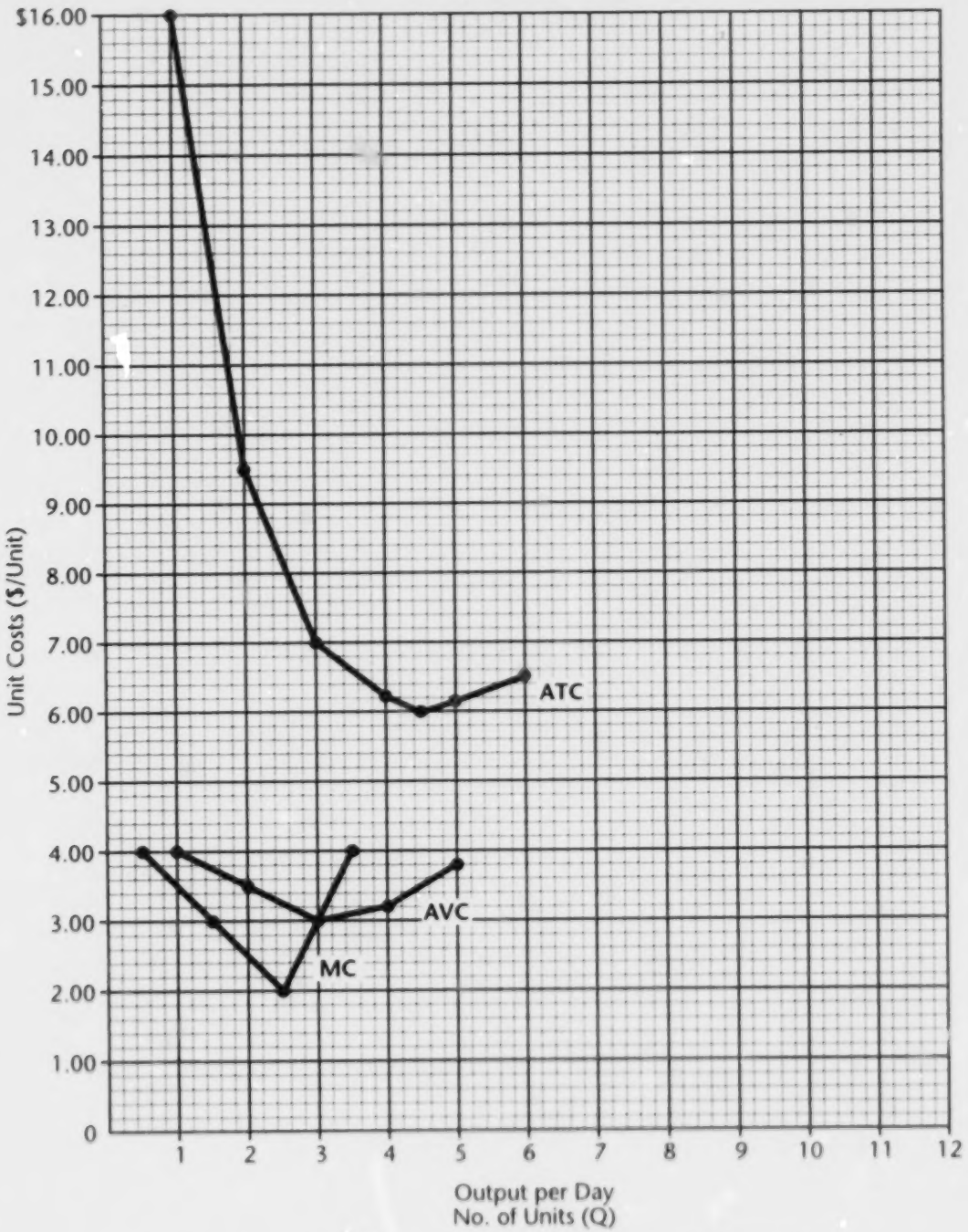
ACTIVITY 34 continued

The Fiasco Company's Cost Curve



Note: Each small square = $ .20 on the vertical axis and .2 units of output on the horizontal axis.
Half units of output are plotted midway between .4 units and .6 units.
Note: MC is plotted between output levels.

ACTIVITY 34 continued

d. Why does average total cost decline at first, then start rising as output is increased?

e. The marginal cost curve intersects both average cost curves (ATC and AVC) at their minimum points. Why?

f. If fixed costs were $20 instead of $12, how would the change affect average variable costs and marginal costs?

2. Given the cost curves for Fiasco Company on the graph *The Fiasco Company's Cost Curve*, and the fact that the competitive market price at which it must sell its output is $11 a unit, fill in the blanks below and add to your graphs for Part A. (Remember, fractions of units are allowed.)

   a. Draw the average and marginal revenue curves on your graph.

   b. In order to maximize profits, Fiasco would sell _____ units, at a price of $ _____. Its average total cost would be $ _____. Its average revenue would be $ _____. It would earn a per unit profit of $ _____ and total profit of $ _____ per day.

   c. If the firm produced instead at the quantity that minimized its average total cost, it would sell _____ units, at a price of $ _____. Its average total cost would be $ _____. Its average revenue would be $ _____. It would earn a per unit profit of $ _____ and total profit of $ _____ per day.

   d. If the competitive market price fell to $5 a unit, Fiasco would sell _____ units. Average total cost would be $ _____. It would earn a per unit *(profit/loss)* of $ _____, and a total *(profit/loss)* of $ _____ per day. (Cross out the incorrect words.)

ACTIVITY 34 continued

Part B. Many Small Firms and the Long Run

1. The long-run cost conditions (including a "normal" rate of profit) for a perfectly competitive firm are as follows:

"Normal" Rate of Profit for a Perfectly Competitive Firm

Output	Total Cost	Average Total Cost	Marginal Cost
1	9	9.00	
			4.00
2	13	6.50	
			5.00
3	18	____	
			6.00
4	24	____	
			____
5	31	6.20	
			____
6	39	____	
			____
7	48	6.86	
			____
8	58	____	
			____
9	69	7.67	
			____
10	81	8.10	

a. Fill in the blanks in the average total cost and marginal cost columns.

b. The level of output at which average total cost is at a minimum is _____ units. At this output average total cost is $ _____ .

c. What quantities would the firm be willing to supply at each of the following prices for its product? (NOTE: Strictly speaking the output decision of the firm under these conditions is ambiguous because for any of the prices two levels of output yield the same profit. For instance, if price is $7/unit, the firm earns $4 profit whether it produces 4 or 5 units. For this exercise, assume the firm chooses the larger of the two output levels.)

Price and Quantity Supplied

Price	Quantity Supplied
$ 6	4
7	5
8	____
9	____
10	____
11	____
12	____

d. In general, the supply schedule (curve) of a perfectly competitive firm coincides with its _____ schedule (curve) in the range where _____ is rising and is greater than the _____ .

2. Suppose the perfectly competitive firm in question 1 is one of 1,000 firms currently operating in a competitive industry, all of which have identical cost functions. The market demand for this industry is given in the table.

Market Demand for an Industry

Price	Quantity Demanded	Quantity Supplied
$ 12	2,000	10,000
11	3,000	9,000
10	4,000	_____
9	5,000	_____
8	6,000	_____
7	7,000	_____
6	8,000	_____

a. Fill in the industry supply schedule in the table *Market Demand for an Industry*. Then answer the following questions by filling in the answer blanks, crossing out the incorrect words in parentheses, or writing a sentence.

b. Explain briefly how the short-run supply schedule (curve) of a competitive industry is derived.

c. Given the present 1,000 firms in the industry, the present equilibrium price for the industry is $ _____ ; the present equilibrium quantity is _____ units. At this price, each firm will be making *(positive economic profit/zero economic profit/negative economic profit/economic losses)*.

d. Given the equilibrium above, and assuring that other firms can enter the industry with the same cost as the present firms, the number of firms in the industry in the long run will tend to *(increase/decrease/remain constant)* and the price will tend to *(increase/decrease/remain constant)*. The output of the industry will tend to *(increase/decrease/remain constant)*, while output per firm will *(increase/decrease/remain constant)*.

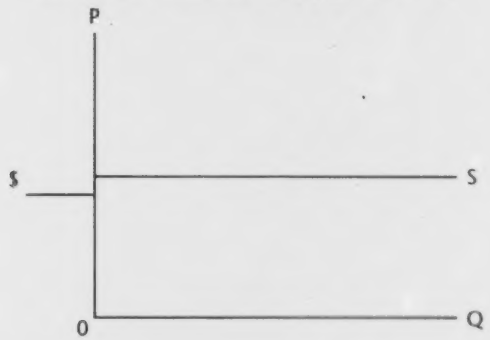
e. If this is a constant cost industry, (i.e., one where input prices don't change as the industry expands), the long-run equilibrium price for the industry will be $ _____ ; output per firm will be _____ units; there will be _____ firms in the industry each earning _____ economic profits;

industry output will be _____ units. The equilibrium price coincides with the _____ per unit cost of production.

f. Can you see why, under the conditions described above, that the long-run market supply curve for this industry would appear as a horizontal line on a graph? Explain.

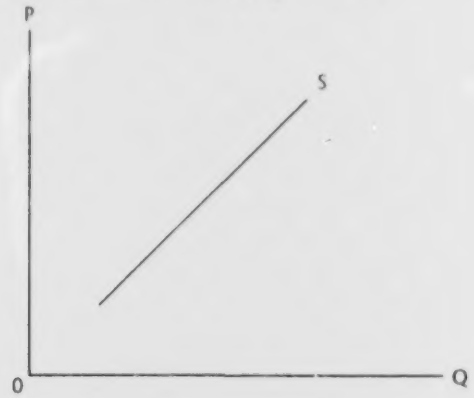
At what price would this horizontal line be plotted?

Long-Run Market Supply Curve A



g. What conditions in input markets would result in a long-run product market supply curve that slopes up to the right? Explain.

Long-Run Market Supply Curve B



h. Which of the *Long-Run Market Supply Curves* (*A* or *B*) do you think is likely to be the most typical case in a real world competitive market? Why?

ACTIVITY 35
Short-Run and Long-Run Competitive Equilibrium

Part A.
There are currently 1,000 producers of Greebes, each with economic costs like those shown in *Diagram A: Cost Situation for Each Greebe Producer.* (You should know how to label each of the cost curves.) The market demand for Greebes is shown in *Diagram B: Market Supply and Demand for Greebes.*

1. Plot on Diagram B the current market supply curve for Greebes and label this curve *S*. (Ask how much each producer will supply at various prices, and figure how much the total supply *from all 1,000 producers together* will be at those prices. NOTE: one million is a thousand thousand—1,000,000.)

Diagram A: Cost Situation for Each Greebe Producer

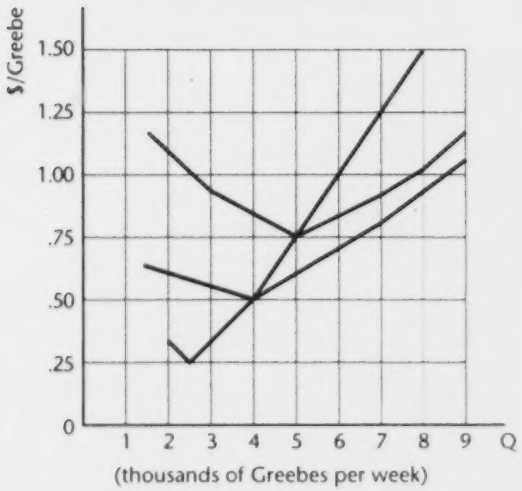
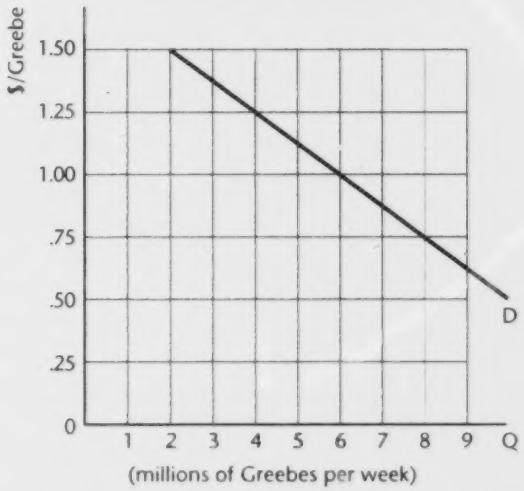


Diagram B: Market Supply and Demand for Greebes



2. Shade in the appropriate profit (or loss) rectangle in Diagram A, and calculate the total amount of economic profit or loss each typical Greebe producer will make under these conditions. Fill in the blanks below to aid you in your calculations.

   a. Price (P) received by each Greebe producer: $ _____ per Greebe

   b. Quantity (Q) produced by each Greebe producer: _____ thousand Greebes per week

   c. Average total cost (ATC) for this quantity (approximate): $ _____ per Greebe

   d. Economic profit (loss) for each unit produced (P – ATC): $ _____ per Greebe

   e. Total economic profit (loss) for each Greebe producer: Profit (loss) per unit x quantity produced = $ _____ per week.

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ACTIVITY 35 continued

3. Is the Greebe market in long-run equilibrium? _____ Why or why not?

4. What is the long-run equilibrium price in this market? $ _____ per Greebe

   a. How many Greebes will each firm produce at this price? _____ thousand Greebes per week.

   b. What will be the total market quantity of Greebes produced at this price? _____ million Greebes per week

   c. How many firms will be in the market at this price?

Part B.
Now, let's start all over again with a new set of cost and demand conditions in the Greebe market. There are again currently 1,000 producers of Greebes, each with *economic costs* like those shown in *Diagram C: New Cost Situation for Each Greebe Producer*. The market demand for Greebes is shown in *Diagram D: New Market Supply and Demand for Greebes*.

1. Plot on Diagram D the current market supply curve for Greebes and label this curve *S*.

Diagram C:
New Cost Situation for Each Greebe Producer

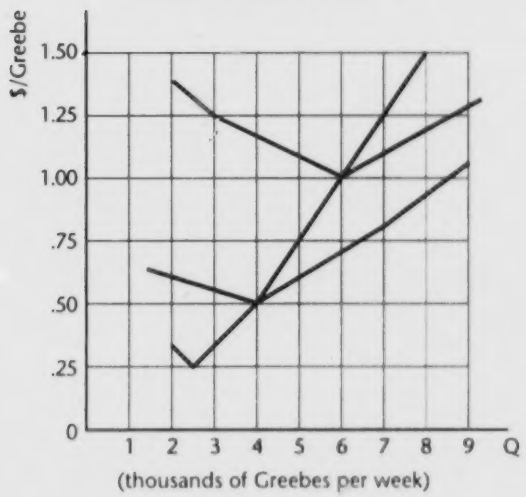
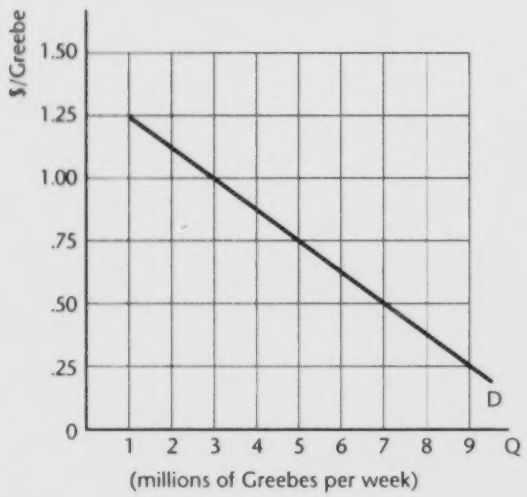


Diagram D:
New Market Supply and Demand for Greebes



ACTIVITY 35 continued

2. Shade in the appropriate profit (or loss) rectangle in Diagram C, and calculate the total amount of economic profit or loss each typical Greebe producer will make under these conditions. Fill in the blanks below to aid you in your calculations.

   a. Price (P) received by each Greebe producer: $ _____ per Greebe

   b. Quantity (Q) produced by each Greebe producer: _____ thousand Greebes per week

   c. Average total cost (ATC) for this quantity (approximate): $ _____ per Greebe

   d. Economic profit (loss) for each unit produced (P - ATC): $ _____ per Greebe

   e. Total economic profit (loss) for each Greebe producer: Profit (loss) per unit x quantity produced = $ _____ per week.

3. Is the Greebe market in long-run equilibrium? Why or why not?

4. a. What is the long-run equilibrium price in this market? $ _____ per Greebe

   b. How many Greebes will each firm produce at this price? _____ thousand Greebes per week.

   c. What will be the total market quantities of Greebes produced at this price? _____ million Greebes per week

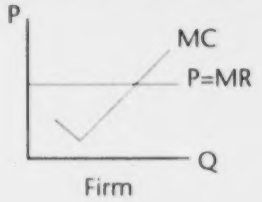
   d. How many firms will be in the market at this price?

ACTIVITY 36
Graphing Perfect Competition

The following firms or industries are all operating in a perfectly competitive market. Illustrate each situation on the graph provided. Label all curves in your answers.

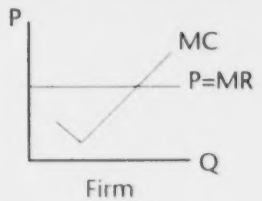
1. A firm experiencing economic profit in the short run.

Short-Run Economic Profit



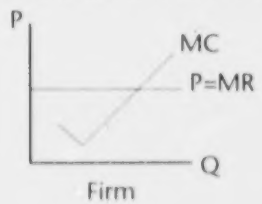
2. A firm operating with an economic loss in the short run.

Short-Run Economic Loss



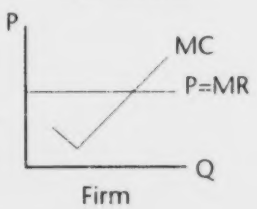
3. A firm in a classic shut-down position.

Classic Shut-Down Position

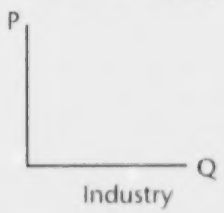


4. Short-run equilibrium for a firm and industry. Assume the firm is making an economic profit.

Short-Run Equilibrium for a Firm



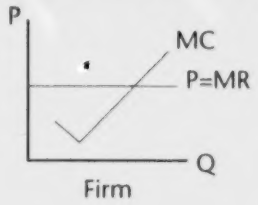
Short-Run Equilibrium for an Industry



Activity developed by Joanne Beaver, Cumberland Valley High School, Mechanicsburg, PA; Janice H. Dukes, Opelika High School, Opelika, AL; and Gloria Washington, Dillard High School, Ft. Lauderdale, FL.

5. Long-run equilibrium for a firm and industry.

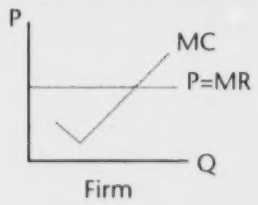
Long-Run Equilibrium for a Firm



Long-Run Equilibrium for an Industry

6. Illustrate how economic profits will disappear in the long run.

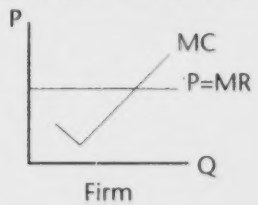
How Economic Profits for a Firm will Disappear in Long Run



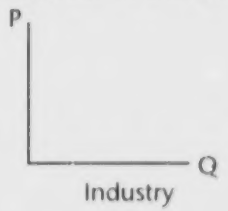
How Economic Profits for an Industry will Disappear in Long Run

7. Illustrate how economic losses will disappear in the long run.

How Economic Losses for a Firm will Disappear in Long Run



How Economic Losses for an Industry will Disappear in Long Run



ACTIVITY 37

Marginal Revenue for an Imperfect Competitor

Marginal revenue is the rate at which *additional* revenue is obtained from selling *additional* output ($\Delta R/\Delta Q$). If selling an additional 100 units of output adds $1,200 to total revenue, the marginal revenue per unit is $1,200/100 = $12.00.

For a perfectly competitive firm (too small to affect the market price) marginal revenue and price (or average revenue) are the same thing. A competitive firm can sell as much or as little output as it desires at the market price on a take-it-or-leave-it basis, but it is too small to have any influence on the price itself. A competitive firm is a "price taker."

For a firm that is big enough to see the whole market demand curve (rather than just the going market price), and/or big enough to influence the market price, however, marginal revenue and price are not the same thing. If a monopolist can see a downward sloping demand curve, it means that the price must be lowered if the monopolist wants to sell more output. Assuming the monopolist charges all customers the same price, marginal revenue will be *less* than price (or average revenue) at any given level of output. A monopolist is thus a "price searcher," who must seek to find the levels of price, output, and marginal revenue that will maximize profits.

Assume that a monopolist faces the demand curve indicated in the table *Average Revenue and Marginal Revenue for a Monopoly*.

Fill in the blanks in the table and plot both the demand curve and the marginal revenue curve on the axes provided on the graph *Plotting Average Revenue and Marginal Revenue for a Monopoly*. Label the demand curve *D* and the marginal revenue curve *MR*. (NOTE that the marginal revenue data are to be plotted midway between the quantity levels shown in the second column of the table, i.e., at the quantity levels given in the last column of the table.)

For a firm big enough to see the whole demand curve, marginal revenue is positive (greater than zero) when the demand curve is elastic, but marginal revenue is negative (less than zero) when the demand curve is inelastic.

Will a monopoly firm ever operate on the inelastic portion of its demand curve? _____
Why or why not?

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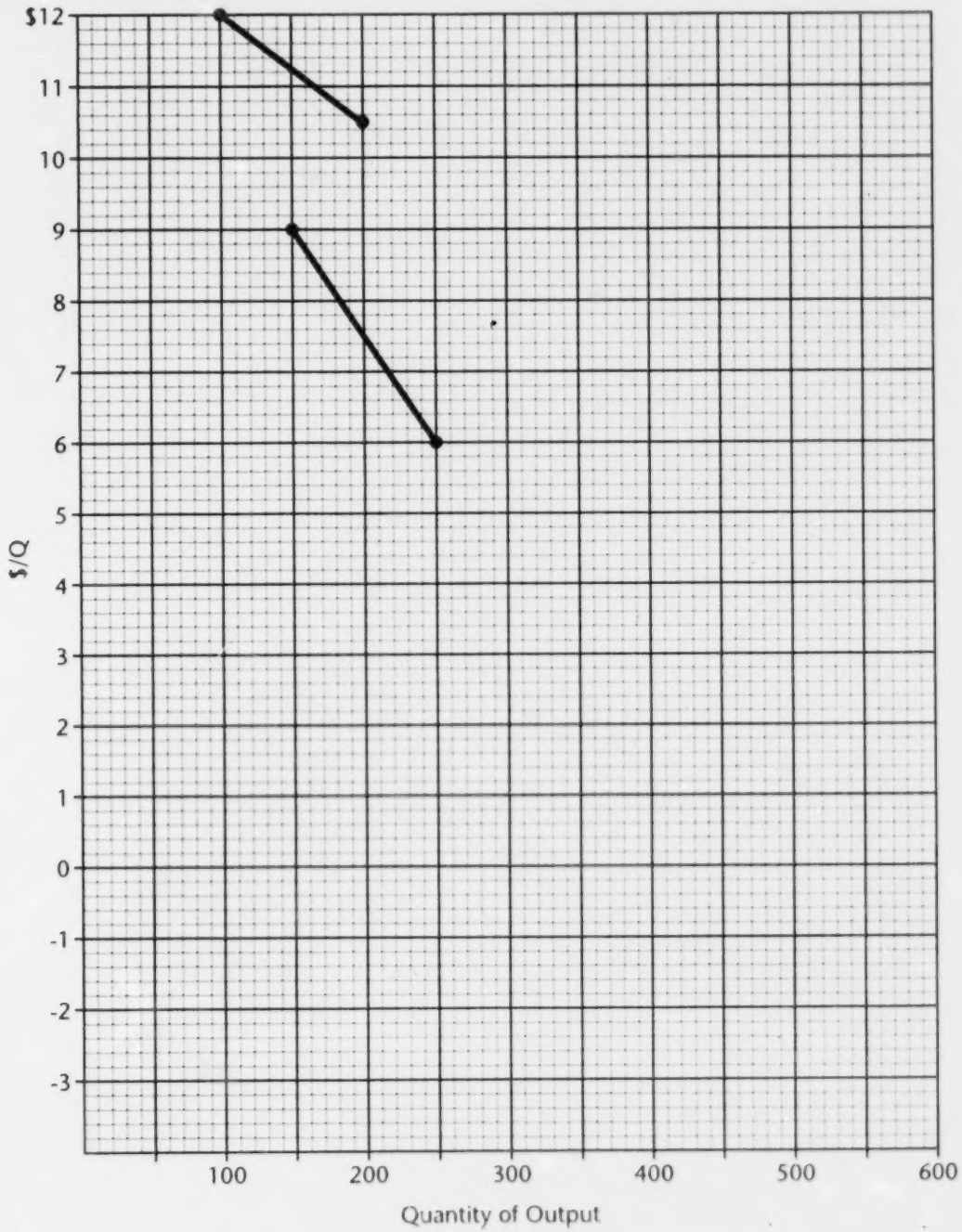
ACTIVITY 37 continued

Average Revenue and Marginal Revenue for a Monopoly

Price (Average Revenue)	Quantity Demanded (Q)	Total Revenue (R)	Change in Total Revenue (ΔR)	Marginal Revenue (ΔR/ΔQ)	Plot at Quantity of
$12.00	100	$1,200			
			$900	$9.00	150
10.50	200	2,100			
			____	____	250
9.00	300	2,700			
			____	____	350
7.50	400	____			
			0	0	450
6.00	500	3,000			
			-300	-300	550
4.50	600	2,700			

ACTIVITY 37 continued

Plotting Average Revenue and Marginal Revenue for a Monopoly



Note: Each small square = $.20 on the vertical axis and 10 units of output on the horizontal axis.

ACTIVITY 38
Pure Monopoly

Like other producers in a market economy, a pure monopolist tries to maximize profit by producing at an output where marginal cost (MC) equals marginal revenue (MR). For a firm in a competitive market, price and marginal revenue are the same, but for a monopolist, who "sees" the entire market demand curve and who must charge all buyers the same price, marginal revenue is below price. This activity considers the choice of output level by a monopolist.

Part A.

1. The table *Pure Monopoly: Cost and Revenue Data* presents a summary of the relevant cost and revenue data facing a pure monopoly firm. Fill in the blanks in the table.

2. Complete the job of plotting the data for MC, MR, ATC (average total cost), and AR (average revenue) in the graph *Profit-Maximizing Equilibrium for a Monopoly*. Since in this problem output cannot increase by a fraction of a unit, the plotted data should connect the points at the output intervals shown in the table.

Pure Monopoly: Cost and Revenue Data

Quantity of Output	Total Cost	Marginal Cost	Average Total Cost	Total Revenue	Marginal Revenue	Average Revenue (Price)
0	$0		$0	$0		$0
		$900			$1,200	
1	900		900	1,200		1,200
		700			900	
2	1,600		800	2,100		1,050
		_____			_____	
3	2,100		700	2,700		900
		_____			300	
4	2,400		_____	3,000		_____
		600			_____	
5	3,000		_____	3,000		_____
		1,200			-300	
6	4,200		_____	2,700		_____

Part B.

After you have completed the table and the graph, answer the questions in Part B by filling in the blanks and shading in the area indicated in question 5. In order to make the mathematics easier, plot marginal revenue and marginal cost at the whole numbers, not between the numbers.

1. A profit-maximizing monopolist would produce an output of _____ units.

2. At this level of output, MC is $ _____ per unit and MR is $ _____ per unit.

3. At this level of output, the AC is $ _____ per unit and the AR (price) is $ _____ per unit.

4. This gives the monopolist an economic profit of $ _____ per unit for a total economic profit of $ _____

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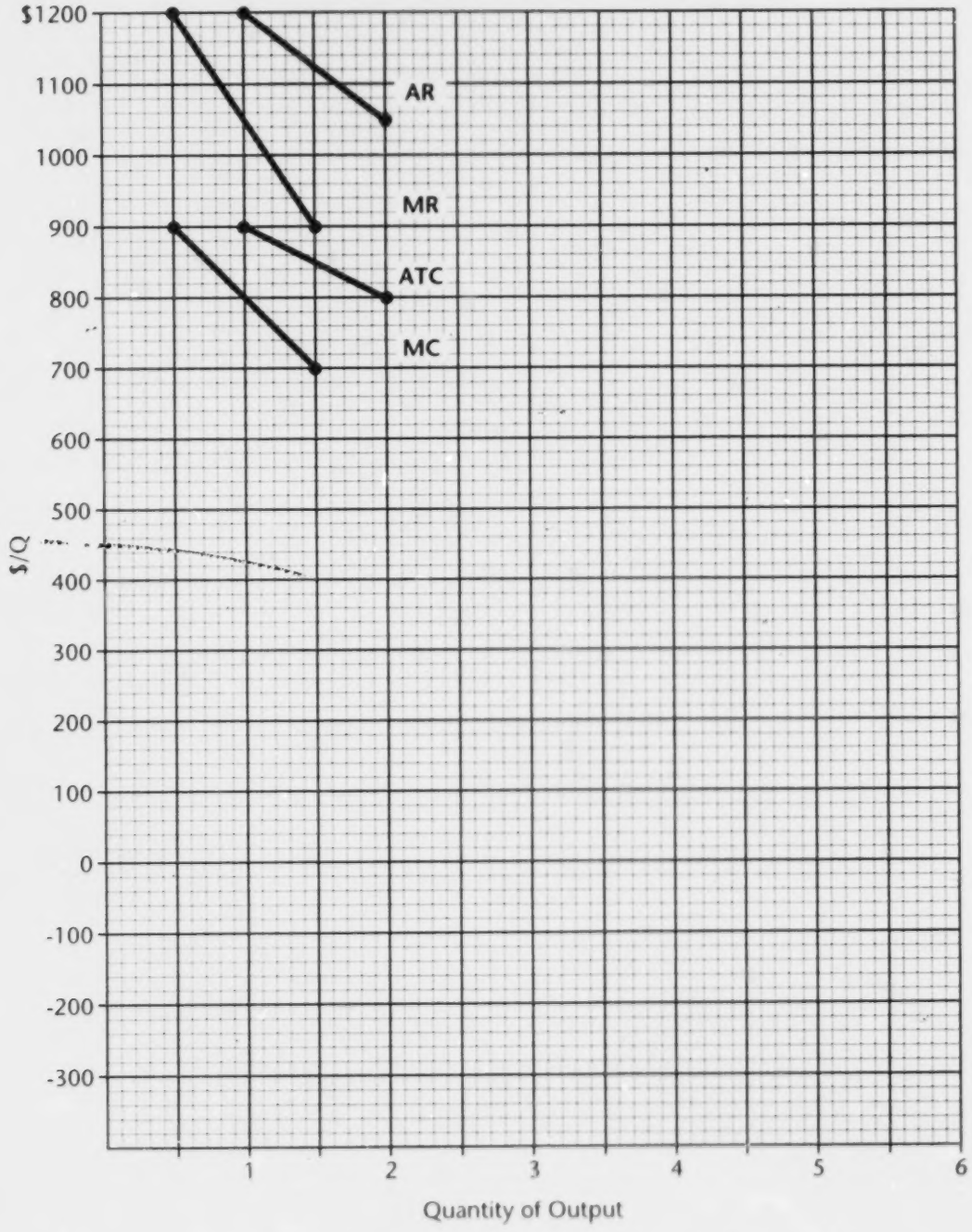
ACTIVITY 38 continued

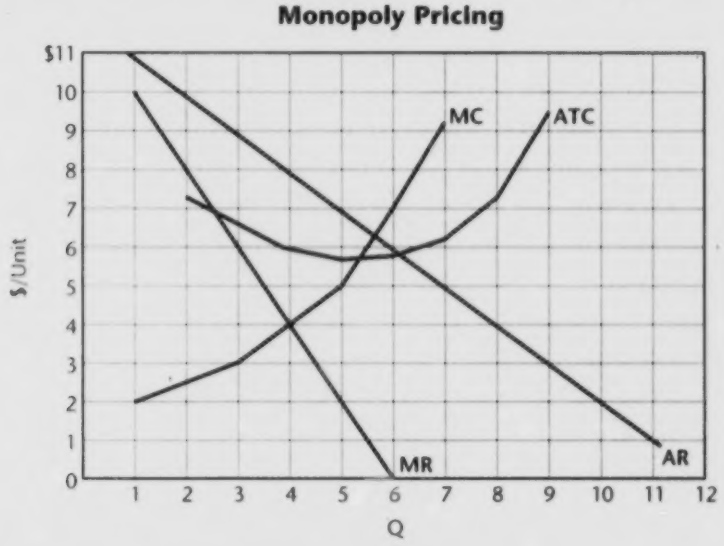
5. Shade in the area on the graph that represents the total economic profit figure indicated in your answer to question 4.

Profit-Maximizing Equilibrium for a Monopoly



Note: Each small square = $20 on the vertical axis and 1/10 unit of output on the horizontal axis.

ACTIVITY 39
Monopoly Pricing



Use the graph *Monopoly Pricing* to answer these questions.

1. What is the maximum profit output? _____
2. What is the price at that output? _____
3. What is revenue per unit at that output? _____
4. What is cost per unit at that output? _____
5. What is total revenue at that output? _____
6. What is total cost at that output? _____
7. What is profit or loss per unit at that output? _____
8. What is total profit or loss at that output? _____
9. At what output and price combination would this firm break even? _____
10. If this were a perfectly competitive industry (other than the fact that demand would be perfectly elastic), excess profits would exist and new firms would enter the industry. Since this is a monopoly situation and new firms cannot enter the industry, what will happen to these excess profits?

11. Based on your answer to question 10, if this monopoly were a government-regulated monopoly and *you* were the government, what restrictions, regulations, or requirements would you place on this company?

ACTIVITY 40
Let's Play Monopoly

Read the article and answer the questions that follow.

Let's Play Monopoly

By Robert J. Barro

It's almost the end of summer and time for the first annual contest to choose the best operating monopoly in America. The contestants, selected by a panel of Harvard economists, are as follows:

1. The U.S. Postal Service.
2. OPEC.
3. Almost any cable TV company.
4. The Ivy League universities (for administering financial aid to students).
5. The NCAA (for administering payments to student-athletes).

Some other worthy candidates, which just missed the cut, are the National Football League, the American Medical Association, and the U.S. Departments of Agriculture and Defense.

Each contestant exhibits fine monopolistic characteristics and is worthy of serious consideration for the award. The U.S. Postal Service claims to be the longest-running monopoly in America and has the distinction of having its control over first-class mail prescribed (perhaps) by the Constitution. The monopoly has preserved large flows of revenues and high wage rates despite studies showing that private companies could carry the mail more efficiently at much lower cost.

The Fax Machine

On the other hand, the position of the Postal Service has been eroded: first, by successful competition on package delivery; second, by the recent entry of express delivery services; and third, and potentially most damaging, by the introduction of the fax machine. Since faxes are bound to supplant a substantial fraction of first-class letters, the failure to get Congress to classify a fax as first-class mail and, hence, the exclusive domain of the post office shows a remarkable loss of political muscle. Thus, despite past glories, it is hard to be sanguine about the long-term prospects of the post office as a flourishing monopoly.

OPEC was impressive in generating billions of dollars for its members from 1973 to the early 1980s. To understand the functioning of this cartel it is important to sort out the good guys from the bad guys.

The good guys, like Saudi Arabia and Kuwait, are the ones who have typically held oil production below capacity and thereby kept prices above the competitive level. The bad guys, like Libya and Iraq (when Iraq was allowed to produce oil), are the ones who have produced as much as they could and thereby kept prices low.

The good guys were responsible for the vast expansion of oil revenues during the blissful period after 1973. (Hence, they were responsible for the considerable difficulties endured by oil consumers.) But, unfortunately, these countries could not keep the other OPEC members in line and were also unable to exclude new producers or prevent conservation by consumers. Thus, oil prices plummeted in 1986 and only the start of the Persian Gulf crisis... [1991] could get prices temporarily back to a respectable level.

In any event, it is unclear that OPEC qualifies for the contest: It is not really American, and its members would probably be arrested for price-fixing if they ever held an official meeting in America.

Most cable TV companies have government-issued licenses that keep competitors out. Thus, this business supports the hypothesis (offered, I think, by George Stigler) that private monopolies are not sustainable for long unless they have the weight of government behind them.

The rapid escalation of prices and the limitations on services seem, however, to be getting customers and their congressional representatives progressively more annoyed. Thus, it would not be surprising if legislative action leads soon to a deterioration of the cable companies' monopoly power. It may even happen that consumers will be able to choose among cable companies in the same way that they choose currently among long-distance telephone carriers; how could the struggling providers maintain a respectable cartel in that environment? This fear about the future diminishes the claim of this otherwise worthy contestant for the first annual prize.

Officials of Ivy League universities have been able to meet in semipublic forums to set rules that determine prices of admission (tuition less financial aid) as a function of applicant characteristics, especially financial resources. In some cases, the schools pooled information to agree in advance on the right price to charge a specific customer. Airlines and other industries that wish to price discriminate can only dream about this kind of setup.

Moreover, the universities have more or less successfully applied a high moral tone to the process: Rich applicants—especially smart rich applicants—are charged more than the competitive price for schooling in order to subsidize the smart poor, but it is unclear why this subsidy should come from the smart rich rather than from taxpayers in general.

In any event, the universities' enviable cartel position has been damaged by the unenlightened Justice Department, which argued that the price-setting meetings were a violation of antitrust laws. Since most of the universities involved have agreed to stop these practices, it may be that future prices for private higher education will come closer to being competitively determined. It seems that this prospect has already motivated some distinguished universities to declare themselves as being in financial difficulty.

The final contestant, the NCAA, has been remarkably successful in holding down "salaries" paid to college athletes. It would be one thing merely to collude to determine price ceilings (for exam-

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Activity developed by Joanne Beaver, Cumberland Valley High School, Mechanicsburg, PA; Janice H. Dukes, Opelika High School, Opelika, AL; and Gloria Washington, Dillard High School, Ft. Lauderdale, FL.

ACTIVITY 40 continued

ple, to restrict payments so that they not exceed tuition plus room and board and some minor additional amounts), but the NCAA has also managed to monopolize all the moral arguments.

Consider a poor ghetto resident who can play basketball well, but not well enough to make it to the NBA. If there were no NCAA, this player might be able legitimately to accumulate a significant amount of cash during a four-year career. But the NCAA ensures that the player will remain poor after four years and, moreover, has convinced most observers that it would be morally wrong for the college to pay the player a competitively determined wage for his or her services.

For many economists, this interference with competition—in a setting that has no obvious reasons for market failure—is itself morally repugnant. But the outrage is compounded here because the transfer is clearly from poor ghetto residents to rich colleges. Compare the situation of contestant number 4, the Ivy League universities, in which the transfer from rich to poor students can readily be supported on Robin Hood grounds.

A Straightforward Decision

The NCAA has the much more difficult task of defending a policy that prevents many poor individuals from earning money. Incredibly, this defense has been so successful that it has even allowed the organization to maintain the moral high ground. When the NCAA maintains its cartel by punishing schools that violate the rules (by paying too much), almost no one doubts that the evil entities are the schools or people who paid the athletes, rather than the cartel enforcers who prevented the athletes from getting paid. Given this extraordinary balancing act, the decision of the panelists was straightforward and the NCAA is the clear and deserving winner of the first annual prize for best monopoly in America.

The panel of economists also considered briefly an award for the least efficient monopoly in America. This choice was, however, too easy. It goes to the American Economic Association, which has been a dismal failure at establishing licensing requirements or other restrictions on entry into the economics profession. It is a sad state of affairs when almost anyone can assume the title of economist.

Mr. Barro, a Journal contributing editor, is an economics professor at Harvard

1. Do you agree or disagree with the final contestants for the monopoly award? Explain.

2. How might the fax machine change the market for first-class mail?

3. What prevents a cartel, particularly OPEC, from maintaining a long-run monopoly? What would help to make it more successful?

4. How do the cable companies represent the normal arguments against monopolies?

ACTIVITY 40 continued

5. What is price discrimination and under what conditions is it successful?

6. Why doesn't the NCAA have competition in providing a forum for young athletes to play sports?

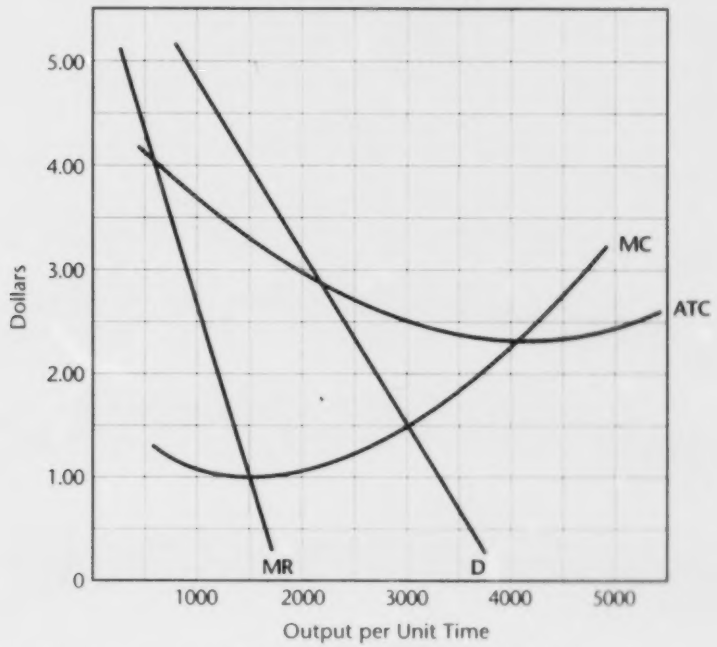
7. If athletes know that only a small percentage will be able to make the NBA, why do they bother playing college basketball?

8. Why are monopolies considered to be bad? Be sure to discuss price, output, and efficiency in your answer.

ACTIVITY 41
Regulating Monopoly

Suppose you are an analyst for a regulatory board that is in charge of the regulation of local monopolies. Your supervisor has given you a list of the three questions below. Given the information on the graph *Regulating a Monopoly,* answer your supervisor's questions.

Regulating a Monopoly



1. If this monopolist is not regulated, what will be the level of:
   a. output? _____
   b. price? _____
   c. total revenue? _____
   d. total costs? _____
   e. profit or loss? _____

2. If this monopolist is regulated by marginal cost pricing (i.e., the socially optimal price), what will be the level of:
   a. output? _____
   b. price? _____
   c. total revenue? _____
   d. total costs? _____
   e. profit or loss? _____
   f. Will the monopoly need a subsidy? _____
   g. If so, how much? _____

Adapted from Robert W. Pulsinelli and Roger LeRoy Miller, *Student Learning Guide to Accompany Economics Today,* 8th edition (New York: HarperCollins College Publishers, 1994), p. 411.

ACTIVITY 41 continued

3. If cost-of-service regulation (fair-return price) is imposed on this monopolist, what will be the level of:

   a. output? _____

   b. price? _____

   c. total revenue? _____

   d. total costs? _____

   e. profit or loss? _____

ACTIVITY 42
Monopoly Consultants, Inc.

You have been retained by seven corporations to advise them on their future output and price decisions. These firms are listed on the chart *Monopoly Consultants, Inc. Monopoly Model.* Each firm is a pure monopoly and desires to maximize its profits or minimize its losses. Before making your recommendations, fill in as much of the incomplete data in the chart as possible. Although you may not be able to fill in every box, there are sufficient data in each case to recommend action that is in the best interest of the firm.

After you have analyzed each case, decide which statement below is the best course of action for the firm involved. Place the number of the statement in the answer column.

1. Nonsense—the information is inconsistent and could not be correct.
2. This firm is in the correct position.
3. This firm should shut down because its revenue does not exceed variable cost.
4. This firm should reduce production and increase price.
5. This firm should increase production and reduce price.

Monopoly Consultants, Inc. Monopoly Model

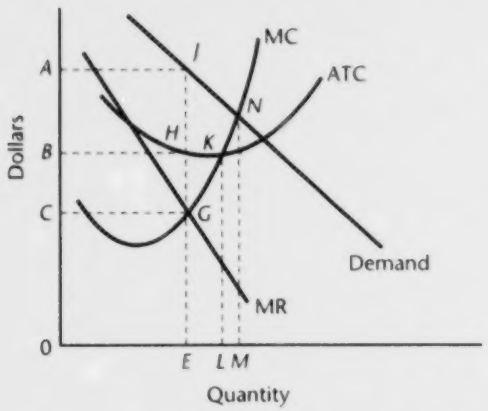
Case	Price	Marginal Revenue	Quantity Output	Total Revenue	Total Cost	Fixed Cost	Average Cost	Marginal Cost	Answer
1	$1.25	$1.00	10,000			$2,000	$1.50	$1.00	
2	$5.00	$4.00	1,000		$4,000		Minimum Level		
3	$1.50	$2.00	10,000				$2.00	$2.00	
4	Above Marginal Revenue	$5.00					$5.00	$5.00	
5			4,000	$8,000	$7,200			$2.00	
6	$7.00	$4.00	2,000		$8,000			$3.00	
7			5,000	$9,000	$10,000	Declining	Minimum Level		

Activity developed by Clare E. Adkin, Jr., St. Joseph High School, St. Joseph, MI.

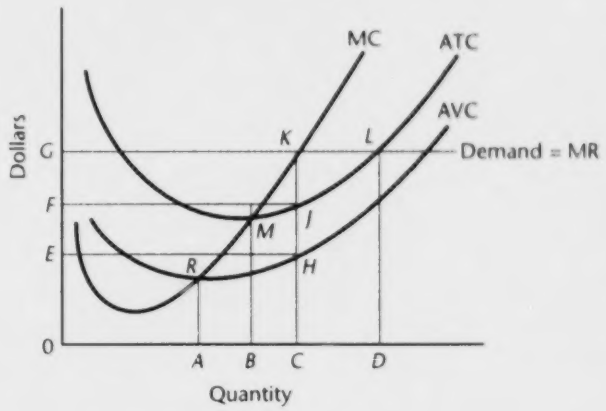
ACTIVITY 43

A Quick Review of Perfect Competition and Monopoly

Monopoly Graph



Perfect Competition Graph



These questions are based on the graphs above. Circle the letter of each correct answer.

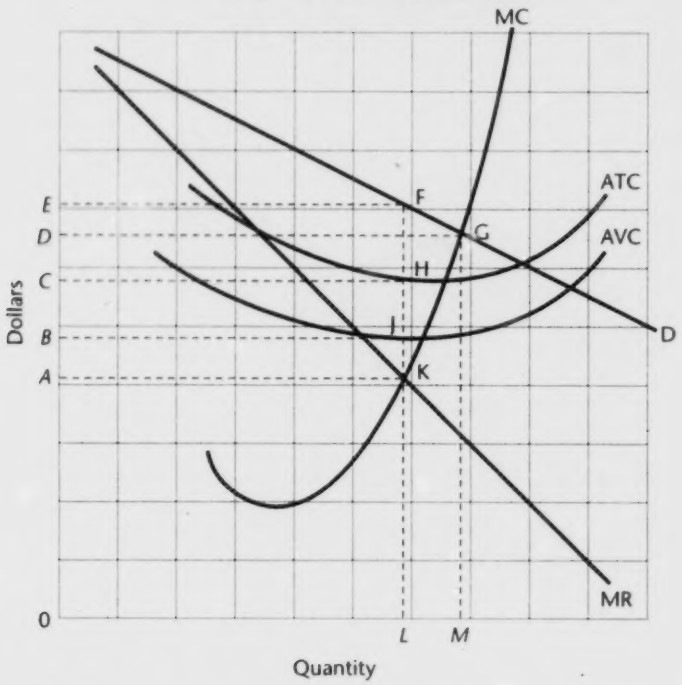
1. A monopoly firm will maximize profits at what price?
   a. OA b. OB c. OC d. OG
2. Economic profits for the monopoly firm are represented by the area of which rectangle?
   a. OCGE b. OAJE c. AJHB d. BAJN
3. Total costs for the monopoly firm are represented by the area of which rectangle?
   a. BKLO b. CGEO c. AJEO d. BHEO
4. The total revenue for the monopoly firm is represented by the area of which rectangle?
   a. OCGE b. OAJE c. AJHB d. BAJN
5. The perfect competitor will maximize profits at what price?
   a. OE b. OF c. OG d. OA
6. The perfect competitor will shut down below which price-output relationship?
   a. K b. M c. L d. R
7. At price OG, the area of which rectangle represents total revenue for the perfect competitor at profit-maximizing output?
   a. OGKC b. OFJC c. FGHJ d. FFJH
8. At output OC, total variable cost is represented by the area of which rectangle?
   a. OGKC b. FGKJ c. OEHC d. OFJC
9. At price OG, profits for the perfect competitor are represented by the area of which rectangle?
   a. OGKC b. OFNB c. FGKJ d. OEHC
10. At what price-output relationship will a perfect competitor operate in the long run?
    a. K b. L c. M d. R

The graphs for this exercise are from Test Bank 1 to Accompany Campbell McConnell, *Economics*, 10th ed. (New York: McGraw-Hill Book Co., 1987), pp. 361 and 367.
Exercise developed by John Morton.

ACTIVITY 44
Monopolistic Competition

1. Use the graph *Monopolistic Competition* to answer the questions that follow.

Monopolistic Competition



a. At what level of output will this firm operate? _____

b. What is marginal revenue at this level of output? _____

c. What price will this firm charge for its product? _____

d. The area of which rectangle is equal to total revenue? _____

e. What is the firm's average total cost? _____

f. The area of which rectangle is equal to the firm's total cost? _____

g. Is the firm making profits or incurring losses? _____

h. The area of which rectangle is equal to profits or losses? _____

2. Would the demand curve for a monopolistic competitor be more or less elastic than the demand curve for a monopolist? Justify your answer.

From Otis Gilley, *Student Learning Guide to Accompany Miller: Economics* (New York: Copyright © HarperCollins Publishers, Inc., 1985), pp. 158–159.
Exercise developed by John Morton.

ACTIVITY 44 continued

3. What are the characteristics of a monopolistically competitive market? In what sense is there competition, and in what sense is there monopoly in this type of market structure?

4. Is monopolistic competition closer to monopoly or to perfect competition?

5. What are three examples of monopolistically competitive markets?

6. True, false, or uncertain, and why? "Monopolistic competition is just another form of pure monopoly."

7. True, false, or uncertain, and why? "Monopolistic competition is even better than perfect competition."

8. True, false, or uncertain, and why? "In the long run, monopolistic competitors produce at their most efficient point."

ACTIVITY 45
Supply, Demand, and Videotape

Part A.
Read the article below and answer the questions that follow.

Michelle Sedlak remembers the good old days in the videotape rental business.

"I started in the business eight years ago at a store in Palos Verdes, in Southern California. We were charging $8 for a 24-hour rental for the first tape, $4 for the second," she says.

Ms. Sedlak is now a manager for Budget Video, a small chain of video stores in Baltimore, Maryland. Her prices today are $1.99 for new releases and 99¢ to $1.50 for standard titles.

The difference between then and now, Ms. Sedlak says, is competition. "Eight years ago you had to *look* for a video store. The nearest competition was likely to be several miles away. Now there's a video store in practically every block. The competition has really driven the price down."

The price reduction Ms. Sedlak cites has been typical of the entire industry. Says Paul Eisele, president of the Fairfield Group, a video industry consulting firm in Connecticut, "Basically, prices vary with the ebb and flow of stores in the industry. As the number of stores increases, prices fall. There have been times, though, when entry of new stores got ahead of growth in the number of families with VCRs, and then prices fell quite sharply. That would force some stores out of business and prices would come back up a little to a new equilibrium."

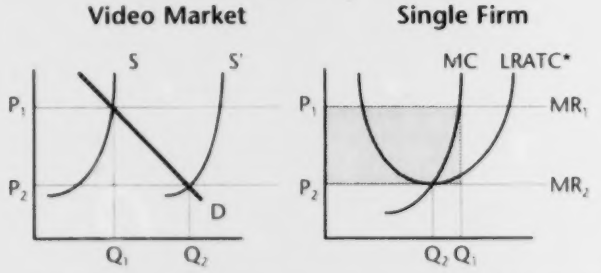
Mr. Eisele notes that high initial profits and the promise of rapid growth attracted firms to the industry in the first place. The business is an easy one to enter—the number of video stores increased from 5,000 in 1981 to 25,000 today, he says.

The industry has traditionally been dominated by independents and small chains. B[illegible]rger chains are growing fast. Chains with 50 or more stores command 15 percent of the total market; that share is rising, according to *The Wall Street Journal*.

The industry can be thought of as an example of either perfect competition or monopolistic competition. Both models predict that, if firms are making an economic profit, new entry will continue until prices have been driven down to the point that no economic profits remain. The accompanying figure tells the story in terms of the model of perfect competition. That model makes the story seem quite abstract, but the forces it describes are very real indeed.

"Several years ago, our profits were as high as 80 percent of sales," Ms. Sedlak recalls. "That fell pretty quickly to 50 percent. Now, we're lucky to get 10 percent. The business has gotten a lot tougher."

Easy Entry in the Video Biz



High initial profits at Price P1, shown by the shaded area in the right panel, attracted entry in the long run, shifting the supply curve to the right (left panel), eliminating economic profits.
* LRATC = long-run average total cost

1. Is the videotape rental business closer to perfect competition or monopolistic competition? Give reasons for your answer.

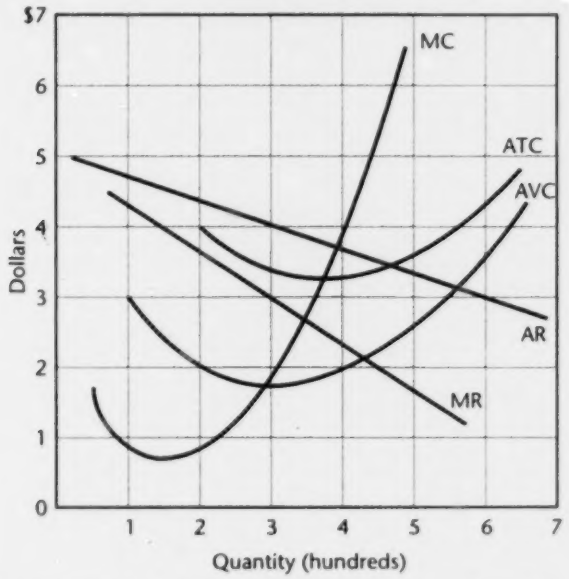
2. What has caused profits in the videotape rental industry to be eliminated in the long run?

Article from Timothy Tregarthen, *The Margin*, Sept./Oct. 1990, p. 29.

ACTIVITY 45 continued

Part B.
The graph *Videotape Rentals* represents a short-run equilibrium position for a videotape rental firm using the monopolistically competitive model. Study the graph and answer the questions that follow.

Videotape Rentals



1. At about what output will this videotape rental firm produce? _____Why?

2. About what price will the firm charge for each videotape rental? _____

3. Is this firm making a profit? _____

4. What will happen to price and output in the long-run for this monopolistic competitor?

5. How much economic profit will this monopolistic competitor make in the long run? _____

6. If this videotape rental firm were a perfect competitor, at about what price and output would this firm produce? Why?

7. How does the long-run equilibrium of a monopolistic competitor differ from the long-run equilibrium of a perfect competitor?

ACTIVITY 46

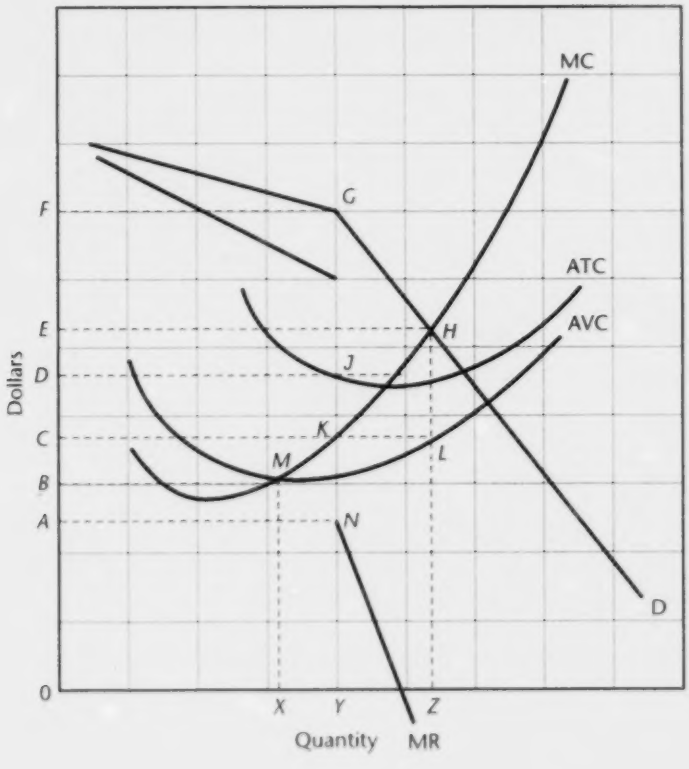
The Kinked Demand Curve of an Oligopolist

The kinked demand curve is a method of analysis designed to explain why oligopolists prefer to compete on quality rather than price. A kinked demand curve illustrates the price rigidity of an oligopolist. The oligopolist, like any other firm, maximizes profits where marginal revenue equals marginal cost. The kinked demand curve shows that if an oligopolistic firm raises its price above the existing price, it will lose market share and have lower profits. This is because the other firms in the industry will not follow the price increase.

If the oligopolistic firm lowers its price, the other firms in the industry will have to follow to avoid losing market share. Therefore, the firm does not gain market share but does receive less revenue. Again, the firm finds that its profits have decreased. For these reasons, oligopolistic firms tend either to have rigid prices or to find a way to collude with each other before raising prices.

Use the *Kinked Demand Curve of an Oligopolist* to answer the questions that follow.

Kinked Demand Curve of an Oligopolist



1. At what level of output will this firm operate? _____

2. What is the marginal cost at this level of output? _____

3. What price will the firm charge for its product? _____

Adapted from Robert W. Pulsinelli and Roger LeRoy Miller, *Student Learning Guide to Accompany Economics Today*, 8th edition, (New York: HarperCollins College Publishers, 1994) p. 396.

ACTIVITY 46 continued

4. The area of which rectangle equals total revenue? _____

5. What is the firm's average cost? _____

6. The area of which rectangle is equal to the firm's total cost? _____

7. The area of which rectangle is equal to the firm's profit? _____

8. Suppose the firm is operating at an output level of Y units. How low would marginal costs at Y units of output have to drop before the firm would lower its price? _____

ACTIVITY 47

From Monopolistic Competition to Oligopoly

Read the article below and answer the questions that follow.

Information Superhighway May Bypass Video-Rental Stores

New telecommunications technology means changes in many markets, including the video-rental market

You and your date have returned to your apartment after an intimate dinner, bottle of wine in hand. Too bad you didn't stop by the video store earlier to pick up *Casablanca* or some other romantic mood setter. Now the evening depends on your conversational skills—or your recording of last night's Letterman show.

But what if the movie of your choice were as close as your phone?

That technology for this and other avenues on the "information superhighway" will soon be a reality. A recent Supreme Court decision paves the way for Baby Bells to offer dial-a-movies, putting phone companies into direct competition with cable companies. But the two industries will be competing on even turf since both are heavily invested in the fiber optic technology that makes vast interconnected data networks possible. It is video-rental stores that risk being left behind as customers let their fingers do the walking.

Already partnerships between telephone and cable companies are in the works. Bell Atlantic announced a merger in October with cable giant Tele-Communications, Inc., or TCI. Nynex has a pending deal to invest $1.2 billion in Viacom. Southwestern Bell, Bell South, and Pacific Telesis have also announced prospective partnerships with cable firms.

Baby Bell U.S. West is bidding to acquire 25.5 percent of Time Warner's cable networks to carry interactive voice and data services. Time Warner's customers would eventually be able to purchase their phone service from the cable company. And U.S. West would have access to Time Warner's extensive movie library for use on its network. Most of America's larger cable operators and phone companies have held talks in the past year about similar arrangements.

Meeting of the minds. Industry analysts once saw cable companies and telephone companies as natural enemies. Now the former adversaries may eventually work together with computers to make interactive technology possible. "I think the horizon is at the end of this century," Michael Kapor, chairman of the Electronic Frontier Foundation, told the *Boston Globe*.

But is the future information highway currently under construction the end of the road for video-rental stores? It depends on how long the build-out takes, according to industry analyst Steve Krause of SRI International, a Menlo Park, Calif., firm. "It is going to take longer than most people think, and cost more too," says Mr. Krause. "It's more like the information super-toll road than the superhighway."

He explains that there are two services people typically think of when they consider the future of video. One is video-on-demand, or VOD, the so-called "nirvana" of the technology in which consumers could choose any movie at any time in their homes. VOD would require a new infrastructure. It is being tested in several markets now, but is not offered commercially.

A second, more modest service is advanced pay-per-view, which would depend on the ability of cable companies to offer more channels and thus more opportunities to watch television.

Mr. Krause believes the less glamorous technologies will dominate the market for the next few years at least. "People assume the existing technology will roll over and play dead," he says. "But video-rental retailers are well established."

According to him, video stores could also join forces with telephone and cable companies, allowing customers to order a movie and have it fed to their homes immediately from the stores. Such technology would eliminate the overhead of purchasing, transporting, and storing videotapes, and could help video retailers stay profitable well into the future.

1. Videotape rental stores produce under what type of market structure? _____
   Justify your answer.

Article from Karen Bishop, *The Margin*, Spring 1994, p. 37.

ACTIVITY 47 continued

2. The new partnerships between phone companies and cable companies produce under what type of competition? _____ Justify your answer.

3. Would you expect the new phone/cable companies to compete on price or product quality? _____ Why?

4. Suppose the emerging alliances between cable and telephone companies create substitutes for videotape rentals. Trace the impact on videotape rentals in the short run and long run.

ACTIVITY 48

Problems on Market Structure and Business

Answer the questions and briefly explain your answers. Feel free to use diagrams to illustrate your point.

1. True, false, or uncertain, and why? "Monopolies always charge the highest possible price."

2. True, false, or uncertain, and why? "To find a monopoly, look for bigness. For example, monopoly is more likely to be found in the oil business than in the dry cleaning business."

3. True, false, or uncertain, and why? "If all the companies in an industry raise their prices at the same time, one can be pretty sure that there is collusion or monopoly behavior in this industry."

4. After several losing seasons, a college is considering dropping football. To what extent should the college's decision makers consider the following budget items? (Hint: Consider variable and fixed costs.)

   a. Tuition scholarships

   b. Payments on the stadium's mortgage

   c. Free tickets to the games for students

   d. Salary of the athletic director

   e. Salary of the football coach and assistant coaches

Activity developed by John Morton.

ACTIVITY 48 continued

5. True, false, or uncertain, and why? "The marginal cost curve for a perfectly competitive firm is the same thing as its supply curve."

6. True, false, or uncertain, and why? "If marginal cost equals marginal revenue, a firm must be breaking even because costs and revenues are equal."

7. The Crazy Toy Company produces yo-yos. The schedule *Crazy Toy Company—Yo-Yo Schedule* gives the total revenue and total cost associated with the production of a certain number of yo-yos. Fixed costs are $1,200.

Crazy Toy Company—Yo-Yo Schedule

Number of yo-yos produced	Total revenue (in dollars)	Total cost (in dollars)
0	0	$1,200
1	150	1,300
2	275	1,350
3	375	1,425
4	460	1,505
5	540	1,595
6	600	1,700
7	640	1,820
8	670	1,960

   a. What are the fixed and variable costs associated with each level of output?

   b. What is the optimal production level for the firm?

   c. In the short run, should the firm shut down? Explain your answer.

8. Why do airlines charge a discounted fare to passengers who fly standby? (Hint: Consider price discrimination.)

ACTIVITY 48 continued

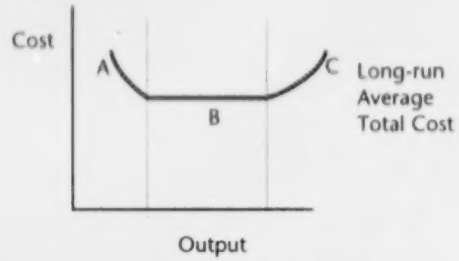
9. Assume your economics teacher got a scholarship to study in Europe this summer. Therefore, the teacher's family wants to rent its house for the summer. They figure if no one rents it, it will still cost them $700 a month in principal, interest, and property insurance. It will cost them an additional $200 a month to maintain it if someone occupies it.
   a. How much rent must they charge to cover all costs? _____
   b. What is the minimum rent they should be willing to accept before they would leave the house unoccupied? _____ Why?

10. True, false, or uncertain, and why? "Without government regulations most firms in a capitalist market system would be monopolies."

Sample Multiple-Choice Questions

Circle the letter of each correct answer.

1. Circle one.



Sections A, B, and C of the long-run average cost curve, respectively, represent:

a. Economies of scale, constant returns to scale, and diseconomies of scale.
b. Diseconomies of scale, constant returns to scale, and economies of scale.
c. Economies of scale, diseconomies of scale, and constant returns to scale.
d. Diseconomies of scale, economies of scale, and constant returns to scale.
e. Minimum efficient scale, constant returns to scale, and diseconomies of scale.

Use the table that follows to answer questions 2, 3, and 4.

Output	Total Cost
0	$18
1	$24
2	$28
3	$30
4	$34
5	$40
6	$48
7	$58
8	$70

2. The average fixed cost of producing six units of output is:

a. $3 b. $8 c. $18 d. $24 e. $30

3. The marginal cost of producing the seventh unit of output is:

a. $4 b. $6 c. $8 d. $10 e. $14

4. If the price is $10 and the firm is a perfect competitor, the profit-maximizing output is:

a. 3 b. 4 c. 5 d. 7 e. 8

5. What is the difference between the short run and the long run in regard to the theory of the firm?

I. All input costs are fixed in the short run.
II. All input costs are variable in the long run.
III. At least one input price is fixed in the short run.

a. I only
b. II only
c. III only
d. I and II only
e. II and III only

6. A firm's short-run marginal cost curve will eventually increase because of:

a. More efficient production.
b. Economies of scale.
c. Diseconomies of scale.
d. Diminishing marginal returns.
e. Increasing marginal returns.

7. Which of the following is true of "normal accounting profits"?

a. They are the only profits earned in the long run by competitive firms.
b. They are not an economic cost of production.
c. They act as signals to attract firms to enter an industry.
d. They are not really money.
e. They are also known as explicit costs.

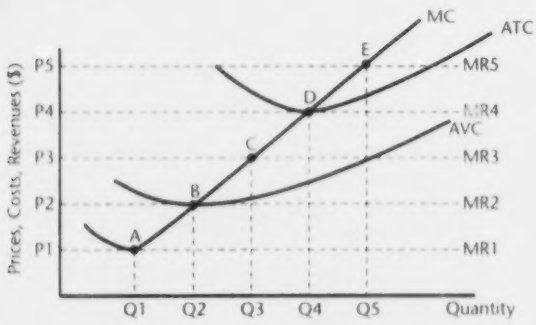
SAMPLE MULTIPLE-CHOICE QUESTIONS continued

8. In the short run, what should a profit-maximizing perfectly competitive firm do if, at the profit-maximizing output, price is lower than average variable cost?
   a. Raise its price.
   b. Lower its price.
   c. Increase its output.
   d. Lower its output slightly.
   e. Shut down.

9. A perfectly competitive firm is operating where marginal revenue is greater than marginal costs. What should this firm do to increase profits?
   a. Increase production.
   b. Decrease production.
   c. Increase price.
   d. Decrease price.
   e. Do nothing.

10. If the average variable cost of producing five units of a product is $100 and the average variable cost of producing six units is $125, then the marginal cost of producing the sixth unit is:
    a. $125 b. $225 c. $250 d. $350 e. $750

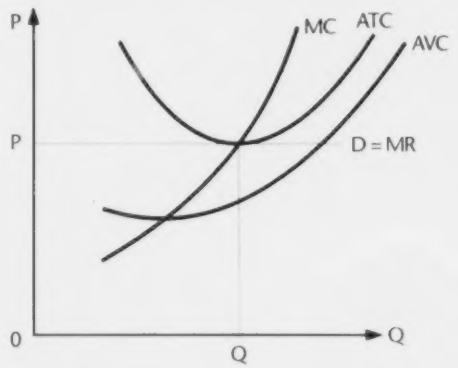
Use the graph that follows to answer questions 11 and 12.



11. At which price will this perfectly competitive firm make an economic profit?
    a. *P1* b. *P2* c. *P3* d. *P4* e. *P5*

12. Which price-quantity level represents long-run equilibrium for this perfectly competitive firm?
    a. A b. B c. C d. D e. E

13. Consider the illustration below of a perfectly competitive firm. This firm is earning:
    a. Losses since the firm is operating at the shut-down point.
    b. Normal profits since the price is above AVC.
    c. Profits since the price is above AVC.
    d. Normal profits since its price just covers ATC.
    e. Losses since it cannot cover its AFC.

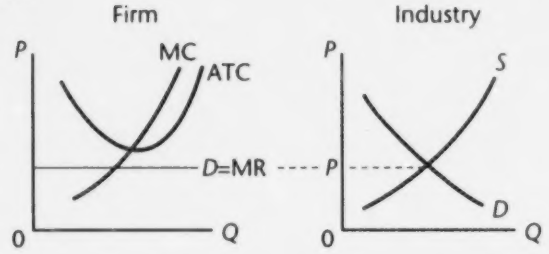


14. In the short run, a firm in a perfectly competitive market will stay in business despite the fact that total revenue is less than total cost as long as:
    a. Total revenue exceeds total sunk costs but not total variable costs.
    b. Total revenue equals total fixed costs.
    c. Total revenue exceeds total variable costs.
    d. Marginal revenue is increasing.
    e. Marginal costs exceed marginal revenue.

SAMPLE MULTIPLE-CHOICE QUESTIONS continued

15. The demand curve for an individual firm in a competitive market is:
    a. Downward sloping to the right.
    b. Vertical.
    c. Dependent on other suppliers.
    d. Horizontal.
    e. Indeterminate.

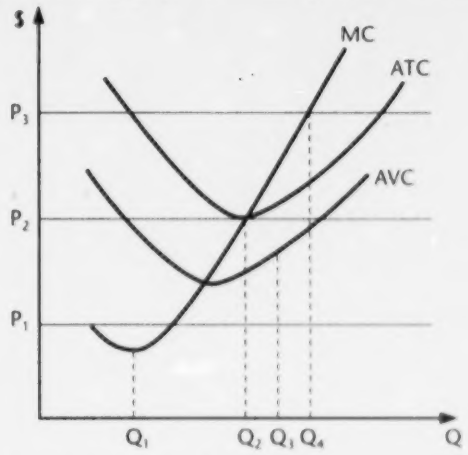
16.



According to the graphs above, what will happen to industry supply and the equilibrium price in the long run?

	Industry supply	Equilibrium price
a.	Decrease	Decrease
b.	Decrease	Increase
c.	Increase	Decrease
d.	Increase	Increase
e.	No change	Decrease

Use the following graph to answer questions 17 and 18.



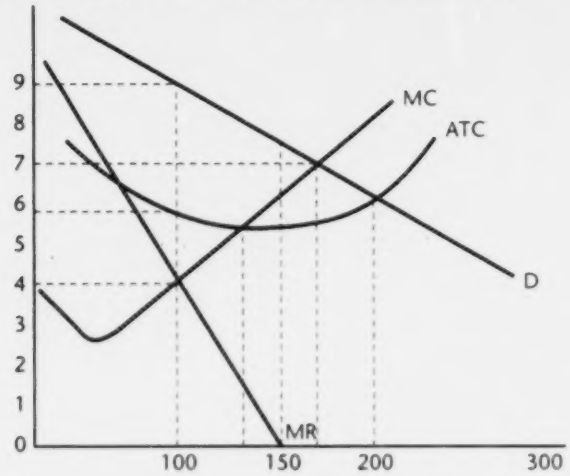
17. If price is P_3, the firm will:
    a. Produce Q_1 units and earn a normal profit.
    b. Produce Q_1 units and make an economic profit.
    c. Produce Q_3 units and make an economic profit.
    d. Produce Q_4 units and make an economic profit.
    e. Shut down.

18. If price is P_2, the firm will:
    a. Produce Q_1 units and earn an economic profit.
    b. Produce Q_2 units and make an economic profit.
    c. Produce Q_2 units and make a normal profit.
    d. Produce Q_3 units and make an economic profit.
    e. Shut down.

19. A pure monopolist's demand curve:
    a. Is perfectly inelastic.
    b. Is kinked at the profit-maximizing price.
    c. Coincides with its marginal revenue curve.
    d. Lies below its marginal revenue curve.
    e. Lies above its marginal revenue curve.

SAMPLE MULTIPLE-CHOICE QUESTIONS continued

Use the graph that follows for questions 20-22.

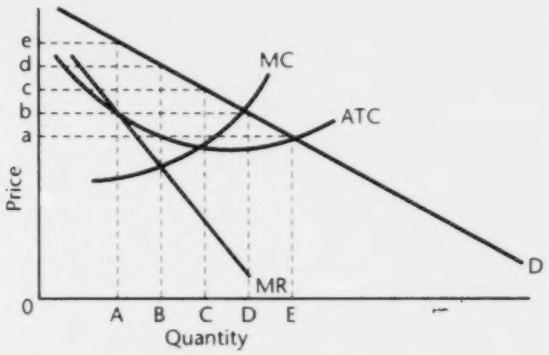


20. The firm in the graph is an unregulated monopolist; it will produce:
    a. 175 units at a price of $7.
    b. 100 units at a price of $6.
    c. 100 units at a price of $9.
    d. About 210 units at about $6.50.
    e. 150 units at a price of about $7.00.

21. The firm in the figure is an unregulated monopolist; it will earn long-run profits of:
    a. $0 b. $300 c. $400 d. $500 e. $900

22. For the firm in the figure, an unregulated monopolist, the price elasticity of demand is equal to one at an output of:
    a. 0 b. 100 c. 150 d. 200 e. 300

Questions 23-25 are based on the following graph of cost and revenue curves for a monopoly firm.

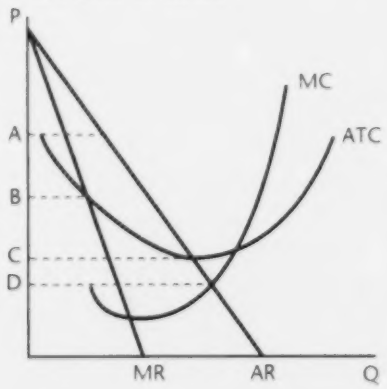


23. To maximize profit, this monopolist should produce at output rate:
    a. OA b. OB c. OC d. OD e. OE

24. The price the monopolist charges at this output will be:
    a. Oa b. Ob c. Oc d. Od e. Oe

25. The profit per unit will be:
    a. ad b. OE c. bd d. AE e. Od

26. Under the usual regulated monopoly, the socially optimal regulated price in the diagram below is:
    a. A
    b. B
    c. C
    d. D
    e. None of these



SAMPLE MULTIPLE-CHOICE QUESTIONS continued

27. What happens to a monopolist's price, profits, and output if its fixed costs decrease?

	Price	Profit	Output
a.	Decrease	Increase	Decrease
b.	Decrease	Decrease	Decrease
c.	No change	Increase	No change
d.	Increase	Increase	Increase
e.	Decrease	No change	Increase

28. Which of the following are characteristics of an oligopolistic market?

I. Easy entry and exit
II. Few firms
III. Interdependence among firms

a. I only
b. II only
c. III only
d. II and III only
e. I, II, and III

29. In the long run, a monopolistically competitive firm will make:
a. More profits than a perfect competitor.
b. Less profits than a perfect competitor.
c. More profits than a monopoly.
d. More profits than an oligopolist.
e. Zero economic profits.

30. If the firms in an oligopoly could costlessly form an industry-wide cartel to jointly maximize profits, the demand curve facing the cartel would be:
a. Less elastic than the industry demand curve.
b. The same as the industry demand curve.
c. More elastic than the industry demand curve.
d. Perfectly inelastic.
e. Horizontal at the market clearing price.

Sample Short Essay Questions

*1. "A monopolist charges the highest price the market will bear, whereas a perfect competitor does not." Explain in detail why you agree or disagree with this statement. As part of your answer, be sure to describe how a monopolist determines the profit-maximizing price.

*2. A single airline provides service from City A to City B.
   a. Explain how the airline will determine the number of passengers it will carry and the price it will charge.
   b. Suppose fixed costs for this airline increase. How will this increase in fixed costs affect the airline's price and output decisions in the short run?

*3. Assume that Star, Incorporated, is a monopoly. Explain each of the following for this firm.
   a. Why marginal revenue and demand are not equal.
   b. How the profit-maximizing level of output and the price are determined in the short run.
   c. Why economic profits continue to exist in the long run.

4. What is the long-run equilibrium condition for a perfectly competitive firm? Is the long-run equilibrium condition of a perfect competitor allocatively and/or technically (productively) efficient? Why or why not?

5. A firm is operating in a perfectly competitive market where price is equal to average variable cost in the short run. What action should the firm take? Explain the economic rationale for this action.

6. Why do oligopolists prefer to use nonprice competition rather than price competition?

7. What is the long-run equilibrium position for a monopolistically competitive firm? How does the long-run equilibrium position of a monopolistically competitive firm compare to the long-run equilibrium position of a perfectly competitive firm?

8. Why will a firm maximize profits where marginal revenue equals marginal cost? Under what conditions, if any, will a firm not operate where marginal revenue equals marginal cost? Explain.

*Actual AP essay question from a past year

Sample Long Essay Questions

*1. In a particular product market there is only one seller and there are significant barriers to entry.
   a. Explain how this firm determines its equilibrium output and price.
   b. Explain whether or not this firm is producing the economically efficient level of output. In your answer include a brief definition of economic efficiency.

*2. Assume that initially a perfectly competitive industry is in long-run equilibrium.
   a. For the typical profit-maximizing firm in this industry explain the following.
      (i) How the firm determines its level of output.
      (ii) What the level of profit is and why it is at that level.
   b. A change occurs that reduces the variable costs of production for all firms in this industry. Explain how and why this decrease in variable costs affects each of the following in the short run.
      (i) The typical firm's level of output.
      (ii) The industry price and level of output.

*3. A retail industry is perfectly competitive and in long-run equilibrium.
   a. The wholesale price increases. Explain what happens initially to the retail industry's output and price.
   b. In reaction to the changes above, the government imposes a retail price ceiling on the product at its original price level. What will be the effect of the price ceiling on the quantity demanded and supplied in the retail industry?
   c. Given the effect of the price ceiling on the typical firm's profits, will firms in the retail industry have an incentive to enter or exit this industry in the long run? Explain.

*4. A perfectly competitive manufacturing industry is in long-run equilibrium. Energy is an important variable input in the production process, and therefore the price of energy is a variable cost. The price of energy decreases for all firms in the industry.
   a. Explain how and why the decrease in this input price will affect this manufacturing industry's output and price in the short run.
   b. What will be the short-run effect on price, output, and profit of a typical firm in this manufacturing industry? Explain.
   c. Will firms enter or exit this manufacturing industry in the long run? Why?

*Actual AP essay question from a past year

Microeconomics

Unit 4
Factor Markets

Key Ideas

- Firms are sellers in a product market and buyers in a factor (resource) market.
- The demand for any resource is derived from the demand for the products that the resource can produce. Thus, resource demand depends upon the price of the good or service that the resource produces and upon the resource's productivity in producing the good or service.
- The demand curve for a resource is downsloping because the marginal physical product (MPP) of additional inputs of a resource will decrease because of the law of diminishing marginal returns. In some textbooks, marginal physical product is called marginal product.
- The resource demand curve for a firm selling in an imperfectly competitive market will be steeper than the resource demand curve for a firm selling in a perfectly competitive market. This is because in addition to the declining marginal physical product in an imperfectly competitive market, product price must be reduced to permit the firm to sell a larger output.
- A firm will continue to hire factors of production as long as their marginal revenue product (MRP) exceeds their marginal resource cost (MRC). A firm will not hire resources once their MRC exceeds their MRP.
- A firm maximizes profits if it can hire resources at a point where a factor's marginal revenue product equals a factor's marginal resource cost. A firm maximizes profit where MRC = MRP.
- In a perfectly competitive labor market, a firm will hire workers until the last worker's wage (MRC) equals the marginal revenue product of that last worker hired.
- When a combination of resources is employed in producing a good or service, the profit-maximizing rule is restated as:

$$\frac{MRPa}{MRCa} = \frac{MRPb}{MRCb} = \frac{MRPn}{MRCn} = 1$$

- When a firm produces the profit-maximizing level of output, it must utilize a least-cost combination of resources. The rule for a least-cost combination of resources is:

$$\frac{MPPa}{MRCa} = \frac{MPPb}{MRCb} \ldots = \frac{MPPn}{MRCn}$$

However, a least-cost combination of resources is not necessarily a profit-maximizing combination since the least-cost rule requires that the marginal physical product per dollar expenditure on each resource be proportionate at any number greater than zero; the profit-maximizing rule requires that the marginal revenue product of each resource employed be equal to its marginal resource cost and, therefore, their ratios must equal 1.

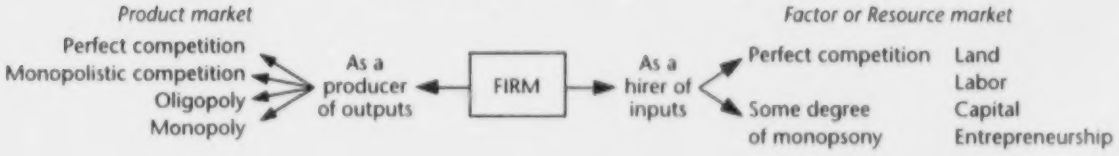
- For a perfectly competitive firm facing a perfectly competitive resource market, resource supply is perfectly elastic and equal to marginal resource cost at a market determined price (wage) for the resource. Under monopsony or imperfect conditions of employment, both resource supply and marginal resource cost are positively sloped curves with the marginal resource cost being a value greater than the price (wage) for all units beyond the first unit of the resource employed.
- Given a downward-sloping marginal revenue product curve and the differences existing between supply and marginal resource cost in perfect competition and monopsony, a monopsonistic employer will pay a lower price (wage) and hire fewer units of a resource than a perfect competitor.
- Economic rent is any payment to the supplier of a resource that is greater than the minimum amount required to employ the desired quantity of the resource to be supplied.
- The equilibrium real interest rate influences the level of investment and helps allocate financial and physical capital to specific firms and industries.
- Profits are the return to entrepreneurs for assuming risk and for organizing and directing economic resources.
- Profits allocate resources according to the demands of consumers.

Jimmy D. Lee, Highland Park High School, Dallas, TX, contributed to these Key Ideas.

ACTIVITY 49
Firm in the Middle

The firm is in the middle of two markets. It is a *supplier* of goods in the product market and will be part of one of several possible market structures. It is a *demander* of productive resources (or inputs or factors of production) in the factor market. It may hire factors under perfectly competitive conditions or it may possess monopsonistic power.

Firm in the Middle



Part A.
Use the *Firm in the Middle* diagram to answer the questions that follow.

1. What is the difference between a factor market and a product market?

2. What determines how much land, labor, and capital a firm will hire?

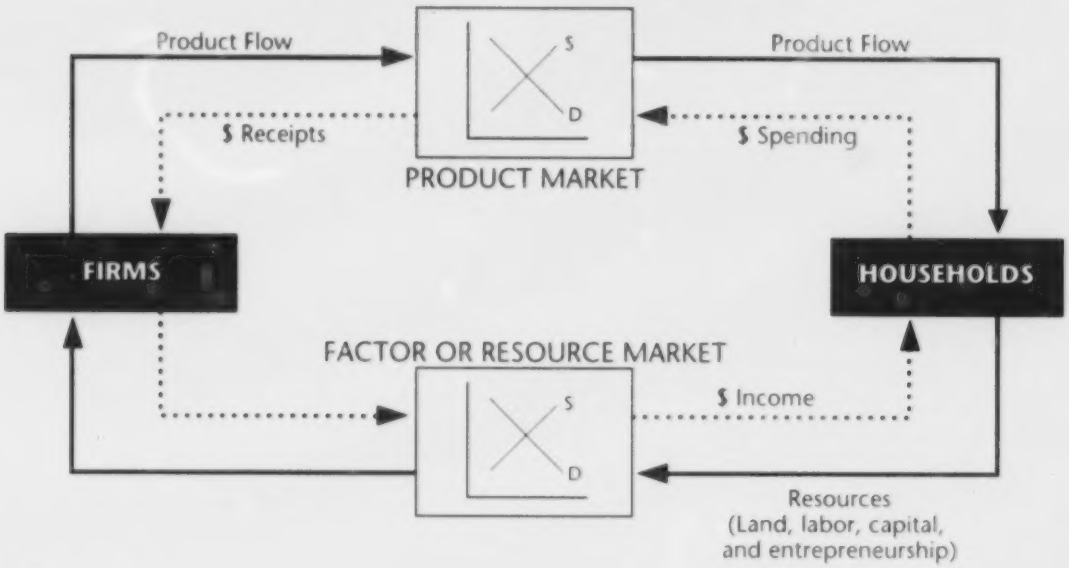
3. What is the difference between monopoly and monopsony?

4. Can a firm be a monopoly in the product market and a competitor in the factor market?

Activity developed by Lewis Karstensson, University of Nevada–Las Vegas; Jimmy Lee, Highland Park High School, Dallas, TX; and Robert Smith, Texas Council on Economic Education.

ACTIVITY 49 continued

Circular Flow for Products and Resources



Part B.

Use the model *Circular Flow for Products and Resources* to answer the questions that follow.

1. Give an example of something that is bought and sold in the product market.

2. Give an example of something that is bought and sold in the factor or resource market.

3. How is demand in the resource or factor market related to demand in the product market?

ACTIVITY 50
The Derived Demand for a Product

The key to understanding how resources are priced in the factor markets is to see the relationship between demand in the factor market and demand in the product market.

The demand for a resource (land, labor, capital, or entrepreneurship) is called *derived demand* because it is derived from the demand for the goods and services that are produced by these resources. To be more specific, the demand for any resource is the downward sloping portion of the marginal revenue product curve. Let's examine why this is so.

1. Complete the following chart *Data for a Yo-Yo Manufacturer*. The firm operates in a perfectly competitive factor market and in a perfectly competitive product market. In a perfectly competitive factor market, market supply and demand determine the price of the factors of production, and in a perfectly competitive product market, supply and demand determine the price of the product.

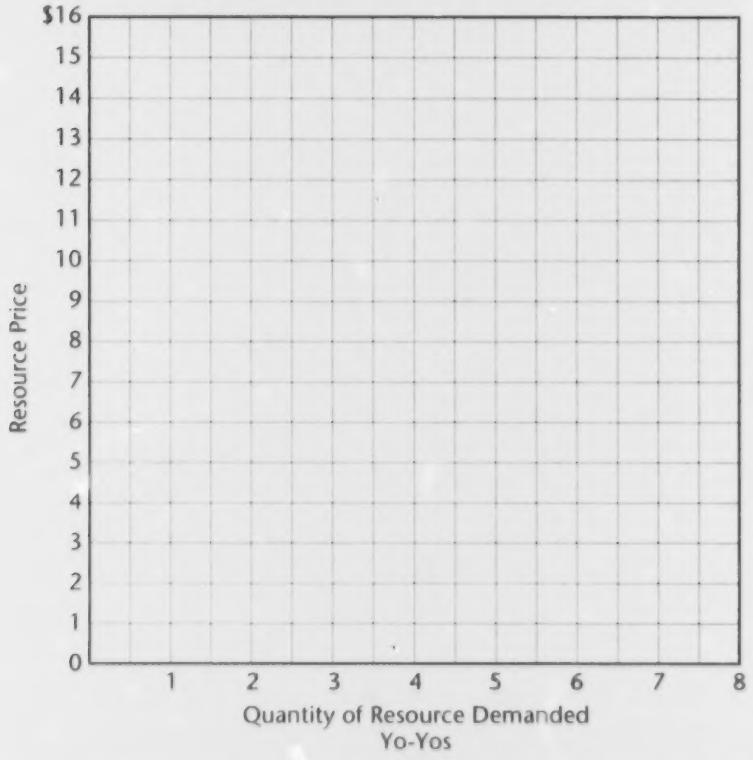
Data for a Yo-Yo Manufacturer

Units of Resource	Total Product	Marginal Physical Product (Marginal Product)	Product Price	Total Revenue	Marginal Revenue Product
0	0		$2.00	$0	
		8			16
1	8		$2.00	$16	
		6			12
2	14		$2.00	$28	
		____			____
3	19		$2.00	____	
		____			____
4	23		$2.00	____	
		____			____
5	26		$2.00	____	
		____			____
6	28		$2.00	____	
		____			____
7	29		$2.00	____	

ACTIVITY 50 continued

2. Use the answers you got in the last column of the chart on the preceding page to graph marginal revenue product on *Plotting Resource Price and Quantity for Yo-Yos*. Label the MRP curve, "MRP = D."

Plotting Resource Price and Quantity for Yo-Yos



3. MRP depends on two variables. One is marginal physical product (MPP), sometimes referred to as marginal product. The second variable is the price of the good or service being produced. For each of the following situations, indicate whether the demand for a resource would increase or decrease.

   a. A new yo-yo machine increases productivity. _____

   b. The price of yo-yos increases. _____

   c. Better training increases the efficiency of yo-yo workers. _____

   d. The demand for yo-yos increases. _____

   e. New technology increases the output of yo-yo workers. _____

   f. Consumers tire of yo-yos. _____

ACTIVITY 51
How Many Workers Should Be Hired?

You are the president of Acme Yo-Yo Company, a small manufacturing firm that produced Supersonic Yo-Yos, a popular toy that makes a "supersonic" noise when used.

Acme's yo-yos are manufactured by yo-yo makers working at two yo-yo making machines. You have been estimating how many yo-yos your company can make using different numbers of workers, and you now have to decide just how many workers Acme will hire.

Your study of your yo-yo making process has shown that you can produce the following number of yo-yos per day depending upon how many workers you hire.

Workers Hired and Yo-Yos Produced

No. of workers hired	No. of yo-yos produced each workday	Change in no. of yo-yos produced
1	20	20
2	50	30
3	70	20
4	85	15
5	95	10
6	100	5

After the second worker is hired, hiring more workers still increases the number of yo-yos produced, but the extra number of yo-yos produced gets smaller and smaller as more workers are hired.

You have also learned that the market for Acme's yo-yos is such that Acme can sell as many yo-yos as it wants each day for $2 each, and that you can hire as many qualified yo-yo makers as you need by paying each one $25 per day.

The table *How Many Workers to Hire for $2 Yo-Yos* can help you decide how many workers to hire. First, you need to calculate the marginal physical product, the *additional* output created by one more worker.* You can do this by comparing the level of output with the level of output from *one less* worker. Next, you need to calculate how much revenue Acme will take in at each possible level of output. Then you will have to calculate how much *additional* revenue is earned by hiring one more worker. You can do this by comparing total revenue at one level of output with total revenue at the *next lowest* level of output. Finally, you can compare the *additional* revenue from hiring each worker (this is called the marginal revenue product of labor) with the *cost* of hiring the additional worker (which in this case is always $25 per day).

How Many Workers to Hire for $2 Yo-Yos

1 Number of workers hired	2 Level of output (number of yo-yos produced per day)	3 Marginal Physical Product (Extra output from hiring one more worker)	4 Price at which yo-yos can be sold	5 Total Revenue (P x Q, or col. 4 x col. 2)	6 Marginal Revenue Product (col. 3 x col. 4)
0	0		$2.00	$0	
		20			$40
1	20		$2.00	($20 x 2) = $40	
		____			____
2	50		$2.00	_____	
		____			____
3	70		$2.00	_____	
		____			____
4	85		$2.00	_____	
		____			____
5	95		$2.00	_____	
		____			____
6	100		$2.00	_____	

* Some textbooks call this marginal product.

Adapted from *Student Activities to Accompany the People on Market Street Series*, Indiana Council on Economic Education, Purdue Research Foundation, 1983.

ACTIVITY 51 continued

1. Why does the number of extra yo-yos produced decrease as more workers are hired?

2. If the wage is $25 per day, how many workers should Acme hire? _____ Why?

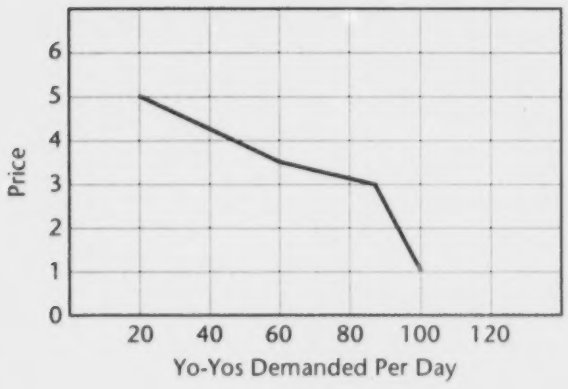
3. If the demand for yo-yos increases so that Acme can sell as many yo-yos as it wants for $3 each, what effect will this have on Acme's level of employment?

4. In order to make as much profit as possible, a firm should hire an additional worker as long as that worker's _____ is greater than his or her _____ .

ACTIVITY 52
The Only (Yo-Yo) Game in Town

Instead of being able to sell as many yo-yos as it wants at $2 each, suppose that Acme Yo-Yo Company is a monopolist. This means that Acme has no direct competition in selling yo-yos (although Acme will face competition from other kinds of toys and games). Acme finds that as a result of its monopolistic position it can charge a price higher than $2 if it wants to cut back its production and sell only a few yo-yos each day. Acme will, however, have to lower its price to sell additional yo-yos.

Daily Price and Demand for Yo-yos



What effect will this have on Acme's demand for labor? You can figure this out by using the same procedure you followed when the price stayed constant at $2. You will have to calculate how much additional revenue will be brought in by hiring one more worker, and comparing that extra revenue with the extra cost of hiring the worker (i.e., the wage rate).

You can use the same table you used before except that now the price changes if more yo-yos are sold.

How Many Workers to Hire for Varying Price Yo-Yos

1 Number of workers hired	2 Level of output (number of yo-yos produced per day)	3 Marginal Physical Product (Extra output from hiring one more worker)	4 Price at which yo-yos can be sold	5 Total Revenue (P x Q, or col. 4 x col. 2)	6 Marginal Revenue Product (the change in total revenue from previous level)
0	0		$0.00	$0	
		20			$100
1	20		$5.00	(20 x $5) = $100	
		____			____
2	50		$4.00	_____	
		____			____
3	70		$3.50	_____	
		____			____
4	85		$3.00	_____	
		____			____
5	95		$2.00	_____	
		____			____
6	100		$1.00	_____	

1. How does Acme's demand for labor differ from when its product sold for $2 each?

From *Student Activities to Accompany the People on Market Street Series*, Indiana Council on Economic Education, Purdue Research Foundation, 1983.

ACTIVITY 52 continued

2. Acme's decision-making rule is the same: If an additional worker adds more to revenue than cost, this worker should be hired. If Acme can still hire workers at $25 per day, how many workers should Acme hire? _____ Why?

ACTIVITY 53
Factor Market Pricing

Part A.

1. Fill in the blank spaces in the table *Number of Workers Hired in a Competitive Market.* Note that marginal figures are placed between levels of employment.

2. If the product of this firm sells for $3.00 in a purely competitive market and the costs for wages and benefits for each worker hired are $60 per day, how many workers would be hired? _____

3. At this employment level, total wage and benefit cost is $ _____ per day; total revenue is $ _____; and the difference is $ _____ .

4. What is the daily wage and benefit cost below which a seventh worker would be hired? $ _____

5. If the price of the competitive firm's product increased to $5.00, how many workers would be hired at a wage and benefit cost of $60.00 a day? _____

Number of Workers Hired in a Competitive Market

Employment No. of Workers (L)	Total Output per Day (Q)	Marginal Physical Product (ΔQ/ΔL)	Marginal Revenue Product (ΔR/ΔL) P = $3.00	Marginal Revenue Product (ΔR/ΔL) P = $5.00
0	0			
		20	$60	$100
1	20			
		30	_____	150
2	50			
		35	105	_____
3	85			
		30	_____	_____
4	115			
		_____	75	_____
5	140			
		_____	_____	100
6	160			
		_____	45	_____
7	175			
		10	_____	_____
8	185			
		_____	15	_____
9	190			
		_____	_____	0
10	190			
		-5	-15	-25
11	185			

Adapted from Phillip Saunders, *Introduction to Microeconomics: Student Workbook*, Fifteenth edition, Bloomington, IN, 1993.
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ACTIVITY 53 continued

Part B.
Assuming that there is a competitive market at Siwash University, graduate students can earn money by working for professors as Research Assistants (RAs) or as Teaching Assistants (TAs). A survey gives the following results:

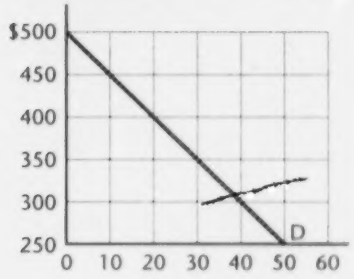
RAs Who Would Be Hired

Monthly Salary	No. of Grad Students Professors Would Hire (D)	No. of Grad Students Who Would Work (S)
$500	0	60
450	10	50
400	20	40
350	30	30
300	40	20
250	50	10

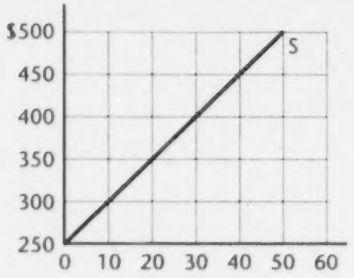
TAs Who Would Be Hired

Monthly Salary	No. of Grad Students Professors Would Hire (D)	No. of Grad Students Who Would Work (S)
$500	10	50
450	20	40
400	30	30
350	40	20
300	50	10
250	60	0

RAs–Supply and Demand



TAs–Supply and Demand



Follow directions, fill in the answer blanks, or cross out the incorrect words in parentheses.

1. Draw in the supply curve of RAs (left diagram) and label it "S."
2. Draw in the demand curve for TAs (right diagram) and label it "D."
3. a. The equilibrium wage for RAs is $ _____ .
   b. The equilibrium wage for TAs is $ _____ .
4. At these wages how many students would be hired? as RAs _____ as TAs _____
5. Suppose research assistants formed a union and agreed not to work unless they received $400 a month.
   a. How many RAs would be employed at $400 a month? _____
   b. How many previously employed RAs would be out of a job at $400 a month? _____

ACTIVITY 53 continued

6. If these unemployed RAs start looking for work as TAs, what would happen in the TA market at the old equilibrium wage? There would be an excess *(demand/supply)*.

7. Under these circumstances, what would you expect to happen to the equilibrium wage of TAs? It would tend to *(rise/fall)*.

8. In the TA market, would this be a shift in the supply curve or a move along it? *(shift/move)*

9. If more TAs are employed at a new equilibrium wage rate, would this be the result of a shift in the demand curve or a move along it? *(shift/move)*

ACTIVITY 54

What Is the Optimum Allocation of Resources?

1. The table *Total Production Employing Varying Amounts of Resource A* shows the total production a firm will be able to obtain if it employs varying amounts of resource A while the amounts of the other resources the firm employs remain constant.
   a. Compute the marginal product of each of the seven units of resource A and enter these figures in the table.
   b. Assume the product the firm produces sells in the market for $1.50 per unit. Compute the total revenue of the firm at each of the eight levels of output and the marginal revenue product of each of the seven units of resource A. Enter these figures in the table.

Total Production Employing Varying Amounts of Resource A

Quantity of Resource A employed	Total product	Marginal product of A	Total revenue	Marginal revenue product of A
0	0		$ _____	
		_____		$_____
1	12		_____	
		_____		_____
2	22		_____	
		_____		_____
3	30		_____	
		_____		_____
4	36		_____	
		_____		_____
5	40		_____	
		_____		_____
6	42		_____	
		_____		_____
7	43		_____	

   c. On the basis of your computations, complete the firm's demand schedule for resource A by indicating in the table *Demand Schedule for Resource A* the number of units of resource A the firm would employ at the given prices.

Demand Schedule for Resource A

Price of A	Quantity of A demanded
$21.00	_____
18.00	_____
15.00	_____
12.00	_____
9.00	_____
6.00	_____
3.00	_____
1.50	_____

Activity developed from Robert C. Bingham and William B. Walstad, *Study Guide to Accompany McConnell and Brue Economics*, (New York: McGraw-Hill Book Co., 1993), pp. 316-317.

ACTIVITY 54 continued

2. The table *Marginal Product Data for Resource B* shows the marginal product data for resource B. Assume that the quantities of other resources employed by the firm remain constant.

   a. Compute the total product (output) of the firm for each of the seven quantities of resource B employed and enter these figures in the table.

   b. Assume that the firm sells its output in an imperfectly competitive market and that the prices at which it can sell its product are those given in the table.

      Compute and enter in the table:

      1) Total revenue for each of the seven quantities of B employed.

      2) The marginal revenue product of each of the seven units of resource B.

   c. How many units of B would the firm employ if the market price of B were:

      1) $25____ 4) $9____

      2) $20____ 5) $5____

      3) $15____ 6) $1____

Marginal Product Data for Resource B

Quantity of resource B employed	Total product	Marginal product of B	Product price	Total revenue	Marginal revenue product of B
0	0	—		$ 0.00	—
		____			$ ____
1	22		$ 1.00	____	
		____			____
2	21		.90	____	
		____			____
3	19		.80	____	
		____			____
4	16		.70	____	
		____			____
5	12		.60	____	
		____			____
6	7		.50	____	
		____			____
7	1		.40	____	

ACTIVITY 54 continued

3. The table *Marginal Revenue Data for Resources C and D* shows the marginal product and marginal revenue product schedules for resources C and D. Both resources are variable and are employed in purely competitive markets. The price of C is $2 and the price of D is $3. Resources C and D are substitutable.

Marginal Revenue Data for Resources C and D

Quantity of resource C employed	Marginal product of C	Marginal revenue product of C	Quantity of resource D employed	Marginal product of D	Marginal revenue product of D
1			1		
	10	$5.00		21	$10.50
2			2		
	8	4.00		18	9.00
3			3		
	6	3.00		15	7.50
4			4		
	5	2.50		12	6.00
5			5		
	4	2.00		9	4.50
6			6		
	3	1.50		6	3.00
7			7		
	2	1.00		3	1.50

a. The least-cost combination of C and D that would enable the firm to produce:
   1) 64 units of its product is _____ C and _____ D.
   2) 99 units of its product is _____ C and _____ D.

b. The profit-maximizing combination of C and D is _____ C and _____ D.

c. When the firm employs the profit-maximizing combination of C and D, it is also employing C and D in the least-cost combination because _____ equals _____.

d. Examination of the figures in the table *Marginal Revenue Data for Resources C and D* reveals that the firm sells its product in a _____ competitive market at a price of _____.

e. Employing the profit-maximizing combination of C and D, the firm's:
   1) Total output is _____.
   2) Total revenue is _____.
   3) Total cost is _____.
   4) Assuming resources C and D are the only inputs, total profit is _____.

ACTIVITY 54 continued

4. Acme Yo-Yo, Inc., can hire labor for $2 per unit and capital at $4 per unit. The firm can produce 50 yo-yos using any one of the three following combinations of factors:

Method of Production

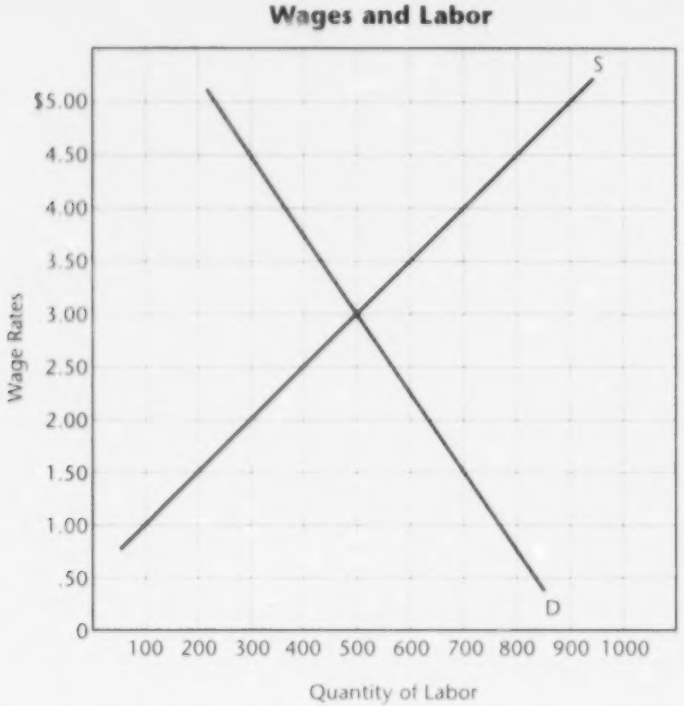
	A	B	C
Units of labor	2	5	6
Units of capital	9	7	5

a. Should Acme use method A, B, or C? _____ Why?

b. How much profit will Acme make if it uses its most profitable combination and sells the yo-yos for $1 each?_____

ACTIVITY 55

How Wages Are Determined in Competitive Labor Markets



Use the graph *Wages and Labor,* which shows the supply and demand curves for a perfectly competitive labor market, to answer the questions that follow.

1. What are two factors that affect the demand for labor?

2. How does marginal revenue product affect the demand for labor?

3. Why is the demand curve for labor downsloping?

4. What determines the supply of labor?

Adapted from Robert W. Pulsinelli and Roger LeRoy Miller, *Student Learning Guide to Accompany Economics Today,* 8th edition (New York: HarperCollins College Publishers, 1994), p. 446.

ACTIVITY 55 continued

5. Why is the supply curve for labor upsloping?

6. What is the equilibrium wage in this labor market? _____

7. How many workers will be hired in this labor market? _____

8. If a minimum wage law raises the minimum wage to $4.50 an hour, what will be the quantity of labor supplied? _____

9. At a minimum wage of $4.50 an hour, what will be the quantity of labor demanded? _____

10. How many workers would be laid off or would lose their jobs because of this minimum wage? _____

11. How many workers entered the labor force seeking a job because of this minimum wage? _____

12. If the demand for labor were more inelastic, would more or fewer workers lose their jobs because of this minimum wage? _____

13. Would skilled or unskilled workers be more likely to lose their jobs because of a minimum wage law? _____

14. Who benefits from the minimum wage? _____

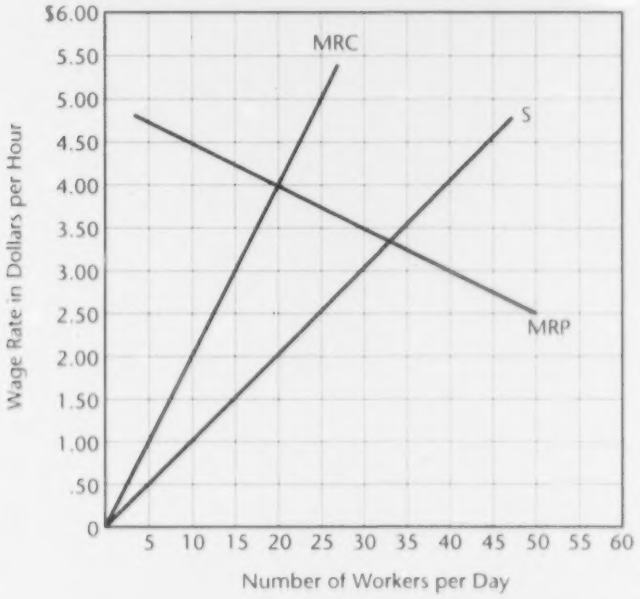
15. Who is hurt by the minimum wage? _____

16. Do you favor a higher minimum wage? _____
Why or why not?

ACTIVITY 56

How Wages Are Determined in Monopsonistic Labor Markets

Wages and Workers in a Monopsony



Use the graph *Wages and Workers in a Monopsony*, which represents a monopsonist selling its product in a competitive product market, to answer the following questions. Fill in the answers or cross out the incorrect words in parentheses.

1. What is another name for the marginal revenue product (MRP) curve?

2. Why is the MRP curve downsloping?

3. Why is the supply curve for labor of the monopsonist upsloping?

Adapted from Robert W. Pulsinelli and Roger LeRoy Miller, *Student Learning Guide to Accompany Economics Today*, 8th edition (New York: HarperCollins College Publishers, 1994), p. 463.

ACTIVITY 56 continued

4. Why is the marginal resource cost (MRC) for a monopsonist greater than the supply curve of a monopsonist?

5. If this firm were in a competitive labor market:
   a. What would be the equilibrium wage? _____
   b. What would be the number of workers employed? _____

6. Given the monopsonistic conditions of the *Wages and Workers in a Monopsony* graph, what are the wage and number of workers employed?
   a. Wage _____
   b. Number of workers employed _____ .

7. Compared to a firm operating in a competitive labor market, a market controlled by a monopsonist will pay a *(higher/lower)* wage rate and hire *(more/fewer)* workers.

8. Suppose the government passes a law mandating a minimum wage of $3 an hour. As a result, this monopsonist will *(increase/decrease)* its employment to _____ workers per day at a wage of _____ per hour.

9. Would a minimum wage law increase or decrease employment in a monopsonistic labor market? _____ Why?

10. Do you think labor markets are closer to monopsony or perfect competition? Support your answer.

ACTIVITY 57

The Effects of Unions on Wages and Employment in Competitive and Monopsonistic Labor Markets

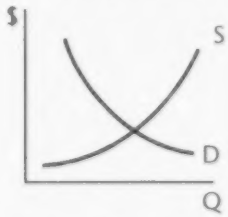
Assume two labor markets. Market 1 is competitive, and Market 2 is monopsonistic. Assume that each of the markets is in an initial equilibrium illustrated in each graph. Assume further that in each of the markets, a union is formed for each of the union goals.

- Illustrate on each graph the effects of the union goal.
- Identify the effects of the union goal on the wage rate and the number of workers employed. Explain the effects.

GOAL 1: The union is successful in requiring that teachers pass a state competency test in order to be employed.

Competency Test Required

Competitive

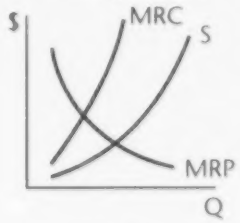


Wage Rate _____

Employment _____

Effects:

Monopsonistic



Wage Rate _____

Employment _____

Effects:

Activity developed by Francis C. McMann, Jr., Washington High School, Cedar Rapids, IA, and David J. Stark, Brainerd High School, Brainerd, MN.

ACTIVITY 57 continued

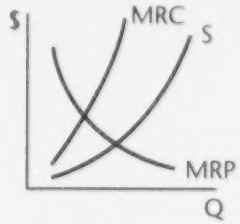
GOAL 2: The labor union conducts a successful national advertising campaign urging people to buy union-made goods.

National Advertising Campaign

Competitive

Wage Rate _____
Employment _____
Effects:

Monopsonistic

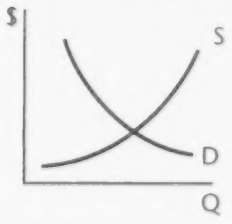


Wage Rate _____
Employment _____
Effects:

GOAL 3: The labor union requires state certification to practice in the state.

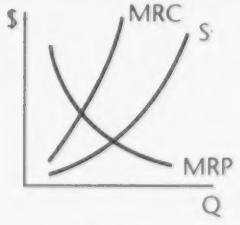
State-Certification Required

Competitive



Wage Rate _____
Employment _____
Effects:

Monopsonistic



Wage Rate _____
Employment _____
Effects:

ACTIVITY 57 continued

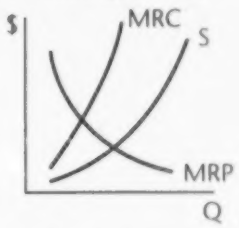
GOAL 4: The labor union educates workers in new methods of production, which leads to their increasing productivity.

Increased Productivity

Competitive

Wage Rate _____
Employment _____
Effects:

Monopsonistic

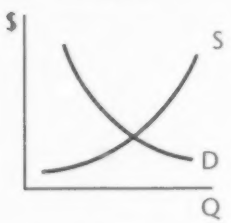


Wage Rate _____
Employment _____
Effects:

GOAL 5: The labor union promotes national legislation to increase quotas and/or tariffs on foreign competitors.

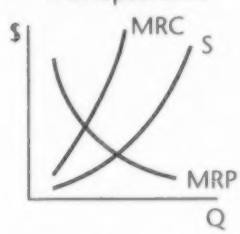
Quotas/Tariffs on Foreign Competition

Competitive



Wage Rate _____
Employment _____
Effects:

Monopsonistic



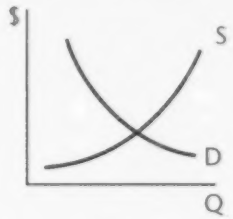
Wage Rate _____
Employment _____
Effects:

ACTIVITY 57 continued

GOAL 6: The labor union bargains for and wins an increase in the wage rate above the equilibrium wage rate.

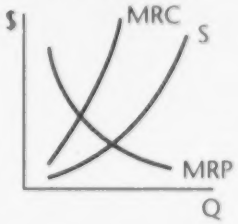
Wage Increase Above Equilibrium Rate

Competitive



Wage Rate _____
Employment _____
Effects:

Monopsonistic

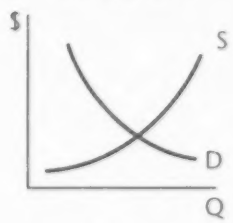


Wage Rate _____
Employment _____
Effects:

GOAL 7: The labor union signs an agreement with employers that forces them to hire only union members who have gone through the union's apprenticeship program.

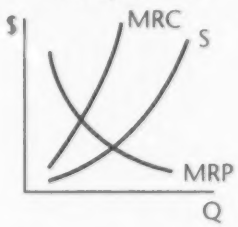
Only Union Members Hired

Competitive



Wage Rate _____
Employment _____
Effects:

Monopsonistic



Wage Rate _____
Employment _____
Effects:

ACTIVITY 58

What Do Land, Athletics, and Government Have in Common? The Story of Economic Rent

Part A.

1. Assume that the quantity of a certain type of land available is 300,000 acres and the demand for this land is that given in the table *Demand for Land at Varying Prices*.

Demand for Land at Varying Prices

Pure land rent, per acre	Land demanded, acres
$350	100,000
300	200,000
250	300,000
200	400,000
150	500,000
100	600,000
50	700,000

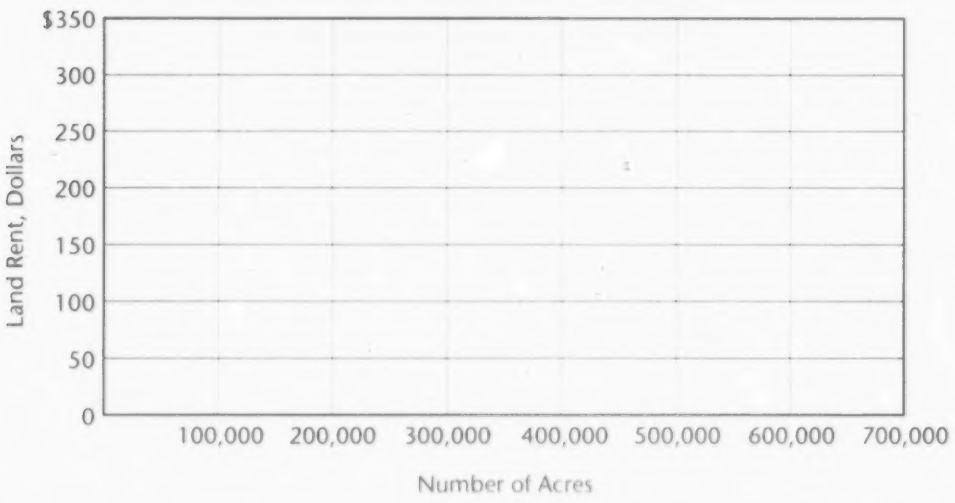
a. On the graph *Plotting Demand Curves for Land*, plot the supply and demand curves for this land and indicate the pure rent for land and the quantity of land rented.

b. The pure rent on this land will be $ _____ .

c. The total quantity of land rented will be _____ acres.

d. If landowners were taxed at a rate of $250/acre for their land, the pure rent on this land after taxes would be $_____ but the number of acres rented would be _____ .

Plotting Demand Curves for Land



Parts of this activity developed from Phillip Saunders, *Introduction to Microeconomics: Student Handbook*, Fifteenth edition, 1993, p. 103, and William Walstad and Robert Bingham, *Study Guide to Accompany McConnell and Brue Economics*, McGraw-Hill, 1993, p. 340.

ACTIVITY 58 continued

2. The table *Yield per Acre on Three Grades of Land* gives the yields (i.e., output per acre) in bushels on three grades of land resulting from varied amounts of expenditure on workers, fertilizer, etc. (Use only these data; don't try to estimate what would happen if other amounts are expended.) To answer the questions below, apply your marginal analysis skills to the data in the table.

Yield per Acre on Three Grades of Land

	Expenditure Per Acre						
Land Quality	0	$100	$200	$300	$400	$500	$600
Grade A land:	0	175	325	450	525	575	615
Grade B land:	0	160	290	375	445	490	525
Grade C land:	0	120	210	290	330	360	385

   a. If the product sells for $1.00 a bushel, how many dollars per acre should be spent on:
   Grade A land? _____ Grade B land? _____ Grade C land? _____

   b. In a competitive market, what do you think the rental price would be for an acre of:
   Grade A land? _____ Grade B land? _____ Grade C land? _____

   (**Note:** Economic rent is defined as a return over and above opportunity cost or the "normal" return necessary to keep a resource in its current use. Using this logic, you can approach question 2b by asking: "What is the most someone would be willing to pay for the right to use an acre of each type of land?")

Part B.

Land is not the only resource whose supply is fixed. For example, the supply of some star athletes is fixed, at least in the short run. Hakeem Olajuwon, star center of the Houston Rockets, was the most valuable player in the National Basketball Association (NBA) in 1994. There is only one "Hakeem the Dream." Let's say he earns $6 million a year. Economic rent is any payment made to a resource above the amount necessary to induce any amount of the resource to be employed. Economic rent can also be defined as the amount over and above the opportunity cost necessary to keep the resource in its current use.

1. Assume that Olajuwon's next best option after playing basketball is to work as a high school teacher and coach. He could earn $40,000 a year in this job. How much economic rent is involved in Olajuwon's salary? _____

2. Now assume that someone else is as good at soccer as Olajuwon is at basketball. If that person wanted to play soccer in the United States, would he receive more or less economic rent than Olajuwon does for playing basketball? Support your answer.

ACTIVITY 58 continued

3. Now assume that the NBA is successful in passing a rule that requires a player to play for the same team for his entire career.
   a. What will happen to Olajuwon's salary? _____
   b. Will there still be economic rent? _____
   c. If there is economic rent, who will receive it and why?

Part C.

The concept of economic rent also is used to explain the behavior of business executives, lawyers, and lobbyists in pursuing government contracts. For example, if a firm received an exclusive monopoly cable-TV contract for a city, it could charge more than the competitive price and receive economic rent. Therefore, firms will fight over this economic rent. To be successful, a firm may hire lobbyists or even offer bribes. This is wasteful behavior because valuable time used to get the contract could be used in producing goods and services. Economists believe that these activities will be undertaken until the cost equals the economic rent.

1. A city is offering a cable-TV contract for 20 years. The potential revenues from this exclusive franchise are $900 million. The costs including a normal profit are $500 million. How much economic rent is involved in this contract? _____
2. What is the maximum amount that will be wasted gaining the contract? _____
3. If city officials want the economic rent to go to the residents of the city, what steps should they take in awarding the contract?

ACTIVITY 59

The Determination of Interest Rates and Their Effect on Investment Decisions

Part A.
Fill in the answer blanks or cross out the incorrect words in parentheses.

1. a. Interest is the price paid for the use of _____.
   b. Interest is typically stated as a _____ of the amount of money borrowed.

2. Money or financial capital is obtained in the loanable funds market.
   a. The equilibrium rate of interest is determined by the intersection of the _____ curve and the _____ curve for loanable funds.
   b. The quantity demanded for loanable funds is *(greater than/less than/equal to)* the quantity supplied at the equilibrium rate of interest.

3. a. The quantity supplied of loanable funds is *(inversely/directly)* related to the interest rate.
   b. In this case, the higher the interest rate, the *(more/fewer)* funds households are willing to save and make available for loans.

4. a. The quantity demanded of loanable funds is *(inversely/directly)* related to the interest rate.
   b. In this case, the higher the interest rate, the *(more/less)* the quantity demanded for loanable funds because there are _____ opportunities for profitable investment.
   c. An investment is considered profitable if the _____ is greater than the interest rate.

5. The interest rate performs two important functions. It helps determine how much _____ will occur in the economy and then _____ it among various firms and industries.

Part B.
The *Schedule of Interest Rates* shows interest rates (column 1), the associated quantity demanded of loanable funds (column 2), and the quantity supplied of loanable funds (column 4) in billions of dollars at those interest rates.

Schedule of Interest Rates

Interest Rate (1)	Quantity Demanded (2)	(3)	Quantity Supplied (4)	(5)
12%	50	_____	260	_____
10%	100	_____	240	_____
8%	150	_____	220	_____
6%	200	_____	200	_____
4%	250	_____	180	_____
2%	300	_____	160	_____

Activity developed from Robert C. Bingham and William B. Walstad, *Study Guide to Accompany McConnell and Brue Economics*, (New York: McGraw-Hill Book Co., 1993), pp. 341-342.

ACTIVITY 59 continued

1. Plot the demand and supply schedules on the graph *Loanable Funds—Demand and Supply.* The interest rate is measured on the vertical axis and the quantity demanded or supplied is measured on the horizontal axis.

2. a. The equilibrium interest rate is _____.

   b. The quantity demanded is _____ billion and the quantity supplied is _____ billion.

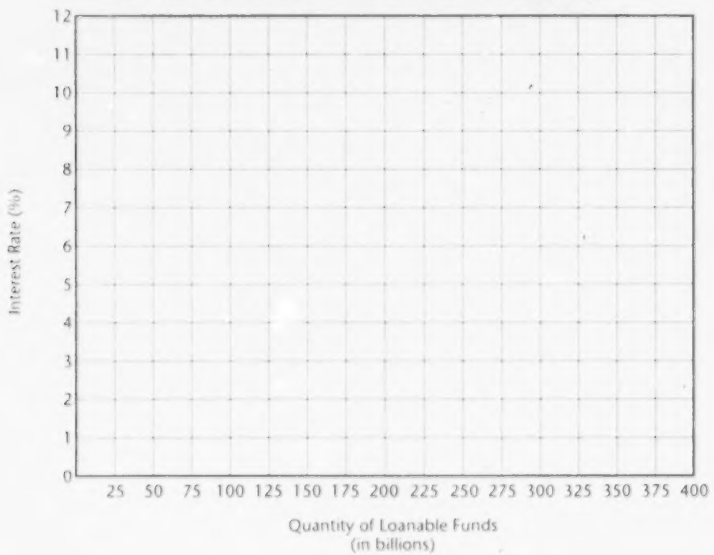
3. a. At an interest rate of ten percent, the quantity demanded of loanable funds is _____ billion and the quantity supplied of loanable funds is _____ billion.

   b. There is an excess of loanable funds of _____ billion.

4. a. At an interest rate of four percent, the quantity demanded of loanable funds is _____ billion and the quantity supplied of loanable funds is _____.

   b. There is a shortage of loanable funds of _____ billion.

Loanable Funds–Demand and Supply



ACTIVITY 59 continued

5. If GDP increases and the demand for loanable funds increases by $70 billion at each interest rate, then the new equilibrium interest rate will be _____ percent and the equilibrium quantity of loanable funds will be _____ billion. Fill in the new demand schedule in column 3 of the table *Schedule of Interest Rates* and plot this new demand curve on the graph *Loanable Funds—Demand and Supply*.

6. Then, because of changes in tax laws, households become more thrifty by $140 billion at each interest rate. The new equilibrium interest rate will be _____ and the equilibrium quantity of loanable funds will be _____ billion. Fill in the new supply schedule in column 5 of the table and plot this new supply curve on the graph.

7. Now it is time to distinguish between nominal and real interest rates. A nominal interest rate is uncorrected for inflation and is the interest rate normally quoted in newspapers. A real interest rate is the nominal interest rate minus the rate of inflation. It is real interest rates—not nominal interest rates—that affect investment decisions.

   a. If the nominal interest rate is nine percent and the rate of inflation is five percent, the real interest rate is _____ percent.

   b. True, false, or uncertain, and why? "The lowest real interest rate possible is a rate of zero percent."

ACTIVITY 60
Super Profits

Eddie Jones looked up from his desk at United Broadcasting Network. His supernatural hearing power had picked up a conversation from the Dew Drop Inn several blocks away.

"Look at this," exclaimed Rod Grigsby. "How can they print such lies?"

Cindy Townsend twisted sideways in her seat to read the advertisement that had upset Rod. The ad claimed that Mammoth Oil Corporation made a profit of six cents per gallon on its gasoline. Most of the money Mammoth Oil receives goes to pay workers, buy supplies, or pay interest on borrowed capital.

"That's ridiculous," said Rod, "I bet they make fifty cents a gallon!"

Eddie Jones moved quickly—he knew that this was a job for ECON ED.

Five years ago, when Eddie was in college, he had dozed off one night while studying economics. He later remembered a weird dream in which a mysterious genie had told him that he would be given supernatural powers of sight, hearing, and speed if he would use these powers to help develop economic literacy—better understanding of how our economic system works. Eddie *thought* it was a dream until he found that he could see and hear things far beyond the capabilities of mere mortals and that the law of gravity didn't seem to apply to him—he could travel at the speed of light unaided by any type of conveyance.

"Come on, Rod," said Cindy. "We're supposed to be working on this advertising project, not worrying about profits."

"Well, I think we're getting ripped off."

Suddenly, a person with a mask, flowing cape, and a strange emblem on his chest appeared next to them. "Hey, I know you!" Rod said. "You're ECON ED, the guy who straightens out people who have nutty ideas about the economy."

"That's right," said ED, "and you just said something nutty."

"You mean Mammoth Oil really makes six cents a gallon on its gasoline?" Cindy asked.

"Yes," said ED, "that's true, but it doesn't mean much. Most grocery stores make about one cent on every sales dollar."

"I knew it!" Rod shouted. "Mammoth Oil makes *five times* as much profit as other companies!"

"No, Rod, that's not the point," ECON ED explained patiently. "Profits as a percentage of sales are not very meaningful because they merely reflect turnover of inventories, which is very high for grocery stores."

"So how can we tell which firms are making high profits?"

"You have to look at profit as a percentage of investment, sometimes called return on stockholders' equity. This *rate* lets you compare firms in all industries—oil companies, grocery stores, automobile manufacturers, banks, etc."

"What *are* profit rates in these industries?" asked Cindy.

"The average rate of profit for large firms is around eleven or twelve percent. It's higher in industries that are expanding—in fact, that's the role of profit, to tell investors which industries *need* to be expanded in order to meet the demands of consumers. And, profits are lower than average in industries that are contracting."

"I get it," Rod said. "Low profits are signals to investors to get out of an industry."

"You got it," said ECON ED, and he disappeared as quickly as he had appeared.

"Hey, Eddie," June Wilson called as he walked toward his desk, "did you see this article in *The Wall Street Journal*? Looks like we won't get that raise we were hoping for."

"Why not?" Eddie asked as he leaned over June's shoulder to read the story:

> Profits Dip at UBN
>
> Competition from cable television was cited as an important reason for lower profits at United Broadcasting Network—only 9.6% last year, down substantially from 16.8% only three years ago....

Activity developed by Robert Smith, Texas Council on Economic Education.

ACTIVITY 60 continued

1. Why does the fact that Mammoth Oil makes six cents a gallon on its gasoline not mean much?

2. What is the best measure of profits?

3. What would happen if firms in an industry were earning a greater than average return on investment?

4. What would happen if firms in an industry were earning a less than average return on investment?

5. What would happen if the government passed a law that would tax 100 percent of profits if the return on investment was over five percent?

6. What is the function of profits in a market economy?

ACTIVITY 61

Problems on Factor Markets

Part A.
Answer the questions and briefly explain your answers. Feel free to use diagrams to illustrate your points.

1. True, false, or uncertain, and why? "Basketball players are paid more than brain surgeons. This makes no economic sense."

2. True, false, or uncertain, and why? "If it were not for unions pushing up wages, we'd all be working 60 hours a week for $100 a month just like people did a century ago."

3. Firms that want to maximize their profits use a resource until the marginal revenue product of that resource equals the marginal resource cost. Why?

4. True, false, or uncertain, and why? "American workers who are paid $10 an hour cannot possibly compete with workers who are paid $1 an hour in developing countries."

5. Some universities pay their football or basketball coaches more than their presidents. Does this make sense economically? Support your answer.

6. What are the effects of a minimum wage that is above the equilibrium wage in a perfectly competitive market? In a market in which the employer is a monopsonist? Do you believe the labor markets are closer to perfect competition or to monopsony? Justify your answer.

ACTIVITY 61 continued

7. The National Collegiate Athletic Association (NCAA) regulates all college athletics in the United States. It sets the amount of scholarships, the number of scholarships granted, and the regulations for recruiting athletes. The NCAA has hundreds of rules regulating intercollegiate athletics.

   a. What effect do these regulations have on who receives the economic rent from college athletics?

   b. Which colleges have greater incentives to cheat? Why?

   c. Who would gain if the NCAA could no longer set rules for college athletics? Why?

   d. Who would lose if the NCAA could no longer control college athletics? Why?

   e. True, false, or uncertain, and why? "The NCAA is a champion for amateur athletics, and its rules protect the rights of college athletes."

ACTIVITY 61 continued

Part B.

In the table *Firm Operating in a Competitive Market* you are given information about a firm operating in a competitive market. Consider all factors of production fixed, with the exception of labor. The other factors of production cost the firm $50 per day, which may be thought of as a fixed cost. Assume the firm is a profit maximizer.

Firm Operating in a Competitive Market

Labor input (workers per day)	Total physical product (units per day)	Marginal physical product (units per day)	Marginal revenue product ($ per worker)
0	0		
1	22	_____	_____
2	40	_____	_____
3	56	_____	_____
4	70	_____	_____
5	82	_____	_____
6	92	_____	_____
7	100	_____	_____
8	106	_____	_____

Fill in the answer blanks or cross out the incorrect words in parentheses.

1. a. Assume that the firm sells its output at $3 per unit. Complete the last two columns in the table.

   b. If the going market wage is $36 per day, the firm will hire _____ workers per day and produce _____ units of output.

   c. Given your answer to the preceding question, the firm will have total revenues of _____ per day and total costs of _____ per day.

   d. The above will result in a *(profit/loss)* of _____ per day.

2. Suppose you work for a firm that sells its output in a monopoly market. Answer the following questions.

   a. If you hire an additional worker, output goes up by 50 units to 125 units per day. If you wish to sell the additional 50 units, you must lower your price from $3 per unit to $2 per unit. What is the maximum wage you would be willing to pay the additional worker?

ACTIVITY 61 continued

b. Assume that you hired the additional worker and output now stands at 125 units per day. If another worker is hired, output rises to 165 units per day. Given the demand curve for your product, you know that in order to sell the additional output, price will have to be dropped from $2 per unit to $1 per unit. What is the maximum wage you would be willing to pay *this* additional worker?

3. True, false, or uncertain, and why? "Monopsonists will always hire fewer workers and pay lower wages than firms operating in competitive labor markets." (Assume that the monopsonistic and competitive firms have the same costs.)

Sample Multiple-Choice Questions

Circle the letter of each correct answer.

1. The marginal revenue product of an input in a perfectly competitive market decreases as a firm increases the quantity of an input used. What makes this occur?
   a. The law of diminishing marginal returns.
   b. The law of diminishing marginal utility.
   c. The homogeneity of the product.
   d. The free mobility of resources.
   e. The total immobility of resources.

2. A profit-maximizing firm should hire an input as long as:
   a. The firm can increase its total revenue.
   b. The price of the input doesn't exceed the price of the other inputs used in the firm's production.
   c. The marginal revenue product of the input is less than the cost of hiring the input.
   d. The marginal revenue product of the input is greater than the marginal revenue products of other inputs that the firm is using.
   e. The marginal revenue product of the input is at least as much as the cost of hiring the input.

3. The demand for labor will decrease in response to which of the following?
   a. Increased productivity.
   b. Better training of all laborers.
   c. A decrease in the supply of labor.
   d. Decreased demand in markets for consumer goods and services.
   e. An increase in the supply of labor.

4. A firm hiring inputs in a perfectly competitive market will hire inputs up to the following point:
   a. Where the marginal physical product of the input reaches a maximum.
   b. Where the price of the input equals the price of the output.
   c. Where the price of the input equals the marginal physical product of the input.
   d. Where the price of the input equals the marginal revenue product of the input.
   e. None of the above.

Use the following information to answer questions 5-12.

Number of Waiters	Number of Dinners That Can Be Served
0	0
1	50
2	75
3	87
4	97
5	104
6	109

5. The law of diminishing marginal returns occurs after hiring which waiter?
   a. First
   b. Second
   c. Third
   d. Fourth
   e. Fifth

6. What is the marginal productivity of the second waiter?
   a. 3 b. 7 c. 10 d. 12 e. 25

7. What is the average productivity after hiring two waiters?
   a. 20.8 b. 24.25 c. 25.0 d. 29.0 e. 37.5

SAMPLE MULTIPLE-CHOICE QUESTIONS continued

8. After which waiter does the average productivity begin to decline?
   a. First
   b. Second
   c. Third
   d. Fourth
   e. Fifth

9. How many waiters would be attracted to this particular labor market?
   a. 3
   b. 4
   c. 5
   d. 6
   e. An indeterminate number

10. Assume that the restaurant owner will employ a waiter for $35 per night. If each dinner served costs the consumer $5, what is the marginal revenue product of the sixth waiter?
    a. $60 b. $50 c. $35 d. $25 e. $5

11. Assume that the owner will employ a waiter for $35 per night. If each dinner served costs the consumer $5, how many waiters will the owner hire?
    a. 3
    b. 4
    c. 5
    d. 6
    e. An indeterminate number

12. Assume that each dinner served costs the consumer $5. Then the government passes a law requiring that all restaurant workers must be paid a daily wage of $50. How many waiters will the restaurant owner hire?
    a. 2
    b. 3
    c. 4
    d. 5
    e. An indeterminate number

13. If firms in a competitive industry are presently earning an economic profit, what long-run consequences exist for the number of firms in this industry and the market price of their product?

	Number of Firms	Product Price
a.	Increase	Increase
b.	Increase	Decrease
c.	Decrease	Increase
d.	Decrease	Decrease
e.	Decrease	No change

14. A firm is a competitive seller of output at a market price of $3. The only resource required to create its product is labor, which is purchased competitively at a wage rate of $6 per hour. The last worker employed increases total output from 36 to 40 units per hour. What is the marginal revenue product for this worker?
    a. $3
    b. $6
    c. $12
    d. $24
    e. Indeterminable from the information given

15. A firm requires labor and capital to produce a given output. Labor costs $8 per hour, and capital costs $12 per hour. At the current output level, the marginal physical product of labor is 40 units, and the marginal physical product of capital is 60 units. Which of the following actions would this firm undertake to minimize its production costs at the current level of output?

	Labor	Capital
a.	Increase	Increase
b.	Increase	Decrease
c.	Decrease	Increase
d.	Decrease	No change
e.	No change	No change

SAMPLE MULTIPLE-CHOICE QUESTIONS continued

16. Which of the following statements correctly describe(s) a firm that is a monopsonistic employer of labor?

I. The firm determines its level of labor employment by equating the marginal revenue product of labor with its marginal resource cost.

II. The firm pays a wage that is equal to the marginal revenue product of labor.

III. The firm's labor supply curve is more elastic than the labor supply curve of a competitive employer.

a. I only
b. II only
c. III only
d. I and II only
e. I, II, and III

17. In a competitive industry, suppose the marginal revenue product of the last donut baker hired is $35, the marginal revenue product of the last bagel baker hired is $15, and a bakery must pay donut bakers $40 a day and bagel bakers $10 a day. The bakery should hire which of the following in order to maximize profits?

a. More donut bakers and fewer bagel bakers.
b. Fewer donut bakers and more bagel bakers.
c. Fewer of both donut bakers and bagel bakers.
d. More of both donut bakers and bagel bakers.
e. It is currently hiring the right number of donut bakers and bagel bakers.

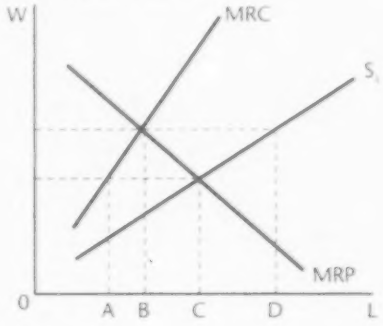
18. What would we expect with an increase in economic profits in a particular industry?

a. Firms to leave the industry.
b. Firms to produce less.
c. Firms to enter the industry.
d. People to buy less.
e. People to buy more.

19. Although statistical data show that broadcasting revenues exceed the profits of most professional sports teams, thus suggesting that these teams could not operate profitably without broadcasting revenues, an economist concluded that this overstates the importance of broadcasting for team owners' profits. How can the concept of economic rent be used to explain this conclusion?

a. If there were no broadcasting, team owners would not have to rent TV lines, and their costs would be lower.
b. If the owners had to pay economic rent to players, they could never make a profit without broadcasting revenues.
c. If there were no broadcasting revenues, players' salaries would not include as much economic rent, and the team owners' costs would be lower.
d. Without broadcasting, owners could operate as monopolies instead of competitors and collect enough economic rent to overcome the loss of TV revenues.
e. If there were no games broadcast, owners could charge more for tickets and increase the total amount of economic rent they receive.

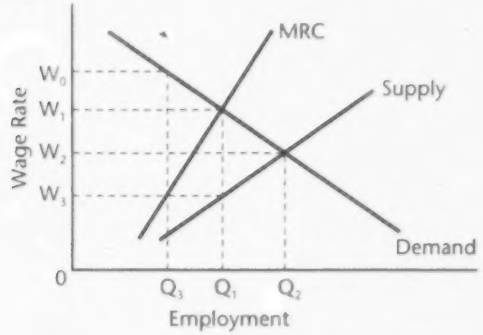
20. The level of employment in the labor market shown below will be:



a. *A*
b. *B*
c. *C*
d. *D*
e. None of the above

SAMPLE MULTIPLE-CHOICE QUESTIONS continued

Use the graph below to answer questions 21, 22, and 23.

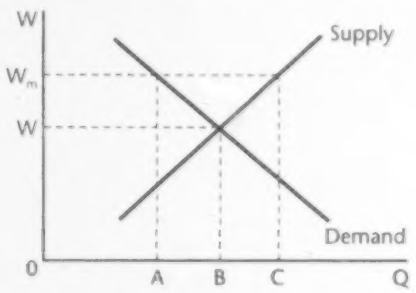


21. Under perfectly competitive conditions in the sale of output and hiring of labor services, the wage rate will be:
    a. W_1 and Q_1 workers will be hired.
    b. W_2 and Q_2 workers will be hired.
    c. W_2 and Q_1 workers will be hired.
    d. W_3 and Q_1 workers will be hired.
    e. $W_1$and Q_2 workers will be hired.

22. Now suppose that through an employers' association, firms in this industry establish a monopsony in the hiring of labor. In this case, the wage rate will be:
    a. W_1 and Q_1 workers will be hired.
    b. W_2 and Q_2 workers will be hired.
    c. W_2 and Q_1 workers will be hired.
    d. W_2 and Q_3 workers will be hired.
    e. W_3 and Q_1 workers will be hired.

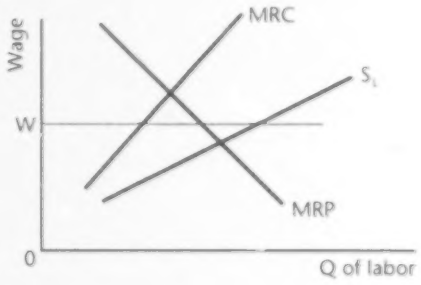
23. Now assume that workers react to the formation of this monopsony by establishing an inclusive union. To what level can this union increase the wage rate without causing the number of jobs to decline below that which the monopsony would otherwise provide?
    a. W_0
    b. W_1
    c. W_2
    d. W_3
    e. Inclusive unions can never increase real wages.

24. In the labor market shown below, if a minimum wage level is set at W_m, it will cause:



    a. Employment to increase from *A* to *B*.
    b. Employment to decrease from *C* to *B*.
    c. Employment to decrease from *B* to *A*.
    d. *BC* workers to be hired.
    e. Employment to increase from *B* to *C*.

25. If a minimum wage is set at *W*, what will happen to employment in the monopsonistic labor market shown in the diagram below?



    a. Employment will decrease.
    b. Employment will increase.
    c. Employment will stay the same.
    d. Employment may increase but usually tends to stay the same.
    e. It is impossible to know what will happen to employment under monopsonistic labor markets.

Sample Short Essay Questions

1. What determines the demand for a resource (factor of production)? Why is the demand for a resource downsloping?

2. List and explain three factors that would increase the demand for a resource, that is, shift the demand curve to the right.

3. Assume a monopsonistic labor market is in equilibrium. What are the effects on wages and employment if workers organize themselves into a labor union and demand an increase in wages?

4. Compare the wage level and employment level of a firm in a perfectly competitive labor market with the wage level and employment level of a firm in a monopsonistic labor market. Both firms have similar costs and sell their goods in a perfectly competitive product market.

5. What determines the elasticity of demand for a resource (a factor of production)?

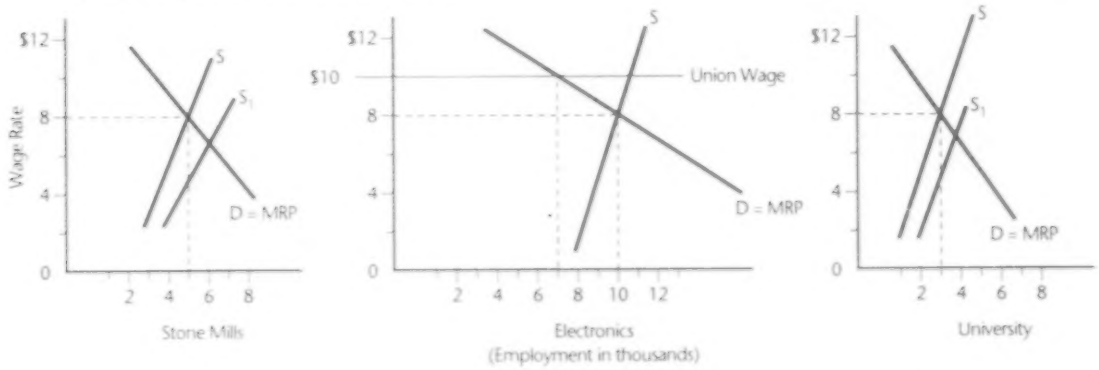
6. What is the difference between money wages and real wages?

7. What is economic rent? Draw a supply curve and a demand curve for land. Now show the effects of an increase in the demand for land. What happens to the amount of economic rent if the demand for land increases?

Sample Long Essay Questions

*1. Initially a country's labor market is competitive and in long-run equilibrium. Now assume that new workers enter the labor market.
   a. Assuming no other changes, explain how the increase in the number of workers will affect each of the following in the short run.
      (i) The wage rate of workers.
      (ii) The costs of production for a typical firm.
      (iii) The price of goods produced by the workers.
   b. Assume that the demand for the goods produced by the workers in part a decreases. Explain the effect of this decrease on each of the following.
      (i) The price of goods produced by the workers.
      (ii) The demand for labor.
      (iii) The wage rate of workers.
   c. Now assume that legislation requiring the establishment of a national minimum wage is proposed. Explain at what level this minimum wage would need to be set to be effective.
   d. Explain how the imposition of the minimum wage in part c would affect each of the following.
      (i) The number of workers employed in the labor market.
      (ii) The costs of production for a typical firm.

**2. Suppose that University City has a perfectly competitive labor market in which there are only three kinds of employment for a certain type of labor. Also suppose that the demand for and supply of this type of labor in each market are as shown below. Total employment is 18,000 persons, as shown, and the average wage rate in each kind of employment is the same—$8 per hour. Now imagine that there is a strong union covering workers in the electronics industry and that it succeeds in negotiating with the employers in this industry an average wage of $10. Show on the diagram the effect this will have on the whole University City labor market, and discuss your analysis by indicating who gains and who loses from the increase in the wages of electronics workers.



*Actual AP essay question from a past year

**Adapted from Phillip Saunders, *Introduction to Microeconomics: Student Workbook*, Fifteenth edition, Bloomington, IN, 1993.

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SAMPLE LONG ESSAY QUESTIONS continued

3. Assume a restaurant owner employs laborers in a perfectly competitive market. Assume the workers organize themselves into a labor union.
   a. What will be the effects on employment and wages if the union bargains for a wage rate above the equilibrium? Illustrate this with a graph.
   b. After bargaining for the wage rate above equilibrium, the demand for dining out increases. Explain the effect of this on your answer in part a. Illustrate this with a graph.

Microeconomics

Unit 5
The Role of Government

Key Ideas

- The economic functions of government include enforcing laws and contracts, maintaining competition, redistributing income, providing public goods, correcting allocations for externalities, and stabilizing the economy.
- Government must provide public goods because a private market will not provide them. Pure public goods must meet the criteria of shared consumption and nonexclusion.
- Even a perfectly competitive market sometimes produces too little of some goods and too much of others; economists call this situation a market failure.
- The market overproduces goods that create negative externalities. A negative externality is created when part of the cost of a transaction is borne by third parties who are not directly involved in the transaction. Negative externalities include pollution and harmful effects of pesticides and smoking. Negative externalities are sometimes called spillover costs.
- The market underproduces goods that create positive externalities. A positive externality is created when benefits of a transaction or activity are received by third parties who are not directly involved in the transaction. Positive externalities include education, vaccinations against diseases, and flood control. Positive externalities are sometimes called spillover benefits.
- Government tries to discourage the production of goods that involve negative externalities and encourage the production of goods that involve positive externalities.
- Pollution is one of the most severe negative externalities. Although it is necessary for the government to correct this negative spillover, it often does so in wasteful and inefficient ways.
- Cleaning up the environment would be efficient if it were cleaned up to the point where the marginal social benefits of the cleanup were equal to the marginal social costs and were done at the least possible cost.
- Most economists believe the environment can be cleaned up at a lower cost by substituting market incentives for many of the current command and control policies.
- The theory of public choice uses economic analysis to evaluate government's operation and policies.
- Public-choice theorists believe politicians and government officials are as self-interested as business people. However, instead of trying to maximize profits, "political entrepreneurs" seek to maximize power, salaries, prestige, and votes. This behavior results in government waste and inefficiency.
- Governments tax to raise revenue. Some taxes are based on the ability-to-pay theory, while others are based on the benefits-received theory.
- Tax rates can be progressive, proportional, or regressive.
- Government taxing and spending policies can change a society's distribution of income.
- The incidence of a tax can be shifted from the person paying the government to someone else. This is accomplished through changes in prices, income, and outputs.

ACTIVITY 62

Private or Public? Public Goods and Services

Our Economic System

An economic system is the way in which people and societies organize economic life to answer three basic questions: *What* goods and services will be produced? *How* will they be produced? *For whom* will they be produced?

In the United states and Canada, most production decisions—*what*, *how*, and *for whom*—are made in the marketplace through interaction of buyers and sellers. This is called the *private sector* of our economy. Other decisions are made by different levels of government. This is called the *public sector* of our economy. Our economic system is often called a *mixed* system since we produce a combination of private and public goods and services.

What Goods and Services Should Be Provided by Governments?

While many goods and services can be effectively provided by the private sector, a few can be provided effectively only by governments. Others can be provided by either, and many goods and services provided by governments are actually produced by private firms. Generally governments try to provide the goods and services that are necessary for the welfare of all the people but that individual consumers might not purchase directly on their own. There are two criteria that can be used in judging whether something should be provided by governments—*nonexclusion* and *shared consumption*.

Nonexclusion. In some situations people cannot be excluded from the benefits of a good or service even if they do not pay for it. If only part of the people bought national defense, for example, the others could not be excluded from the benefits. The nonpurchasers would be protected just as much as the purchasers.

Shared consumption (or *joint use*). In some situations one person's use or consumption of a good or service does not reduce its usefulness to others. The security one person receives from a street light is not diminished by a neighbor receiving the same security. The protection provided by the street light is not reduced by additional people using it.

Private businesses will not produce things that people are not willing to buy, and individual consumers are very reluctant to pay directly for goods and services from which others who do not pay will reap the benefits. "Why should I be the one to buy the street light if everyone else is getting the benefits?" Governments therefore must provide some goods and services, such as national defense, flood control, and judicial and legal systems, that are characterized by shared consumption and are necessarily or should be nonexclusive.

Private and Public Goods

"Pure" private goods are subject to exclusion and not subject to shared consumption. They are purchased directly in the marketplace. "Pure" public goods are not subject to exclusion and are subject to shared consumption. They are purchased indirectly through tax dollars.

Some goods have elements of both private goods and public goods. Fishing in the ocean, for example, is generally not subject to exclusion, but once fish are caught by one person they are not available to others. Likewise, it is sometimes possible to exclude people from theaters, parks, or even roads by charging admission fees or tolls, but the viewing of a movie or the use of a park or a highway by one person usually does not reduce its usefulness to others. Controversy often arises over how these "mixed" goods—sometimes called "common pool resources" and "toll goods"—should be provided and who should pay for them. (See the chart *Combinations of Exclusion and Shared Consumption* on the following page.)

Adapted from *A Guide to Give & Take* (Bloomington, IN: Agency for Instructional Technology, 1982), p. 16. Reprinted with permission of the Agency for Instructional Technology, Box A, Bloomington, IN 47401.

ACTIVITY 62 continued

Combinations of Exclusion and Shared Consumption

		Shared Consumption	
		No	*Yes*
Exclusion	*Yes*	Pure private goods: haircuts, bread, ice cream	Toll goods: theaters, cable TV, parks, toll roads
	No	Common pool resources: Fish taken from the ocean, irrigation water taken from a river, congested roads	Pure public goods: national defense, flood control, street lights, air pollution, mosquito abatement, judicial and legal system, public TV, uncongested roads

1. What is the difference between the private and public sectors of our economy?

2. What are the characteristics of a pure private good?

3. What are the characteristics of a pure public good?

ACTIVITY 62 continued

4. Place each of the following into one of the four boxes in the chart *Determining Combinations of Exclusion and Shared Consumption*.
   a. A college education
   b. Electric power
   c. A haircut
   d. National defense
   e. A private amusement park
   f. Spraying for mosquitoes
   g. Cable television
   h. Canine rabies shots
   i. Street lights
   j. The St. Lawrence Seaway
   l. Public tollroads and bridges
   m. Police and fire protection
   n. Health care
   o. National forest campgrounds
   p. Potato chips
   q. Auto airbags

Determining Combinations of Exclusion and Shared Consumption

		Shared Consumption	
		No	*Yes*
Exclusion	*Yes*		
	No		

5. Circle the box that contains pure private goods. Then draw two circles around the box that contains pure public goods.

ACTIVITY 62 continued

6. What is a "free rider"? Select three goods from the list in question 4 that could have free riders.

7. Should health care or insurance for all be a public or a private good? What are the advantages and disadvantages of each?

8. What does "privatization" mean? Give examples of goods that have been privatized. What else could be privatized?

Robert J. Heffern, Maryvale High School, Cheektowaga, NY, and C. Lee McCarty, Solon High School, Solon, OH, contributed to this activity.

ACTIVITY 63
Private versus Public

Indicate your preferences and judgments concerning the degree to which you believe the goods and services listed below can best be provided by the government or by private business. Do so by placing the capital letter that precedes each good or service on the continuum at the bottom of the page. If you believe that a particular good or service should be provided by private business, place its capital letter at or near the left end of the line, where the word "Private" appears. Place letters for the goods or services you think are better provided by government toward the right end of the line. If you regard the answer to who should provide the product as a toss-up, place the letter in or near the middle.

When you have placed all the letters on the continuum, draw a vertical line to separate those goods and services that you would prefer to see provided privately from those that you would like government to provide.

A College education
B Electric power
C National defense
D Retail selling of groceries
E Supplying of water
F Professional sport events
G Postal service
H Interstate highway facilities
I Elementary schooling
J Police protection
K Garbage collection
L Recreational facilities

Who Should Provide the Product?

Private — Government

From *Master Curriculum Guide in Economics: Teaching Strategies for Consumer Economics (Secondary)* (New York: National Council on Economic Education, 1985), p. 67.

ACTIVITY 64
Third-Party Costs and Benefits

Third-party costs and benefits—or externalities—are the effects of production or consumption of a good or service on people (the third parties) who are not involved in the transaction.

To understand externalities, let's first look at a transaction that has none. The illustration *Supplier and Consumer of Apples* shows the market interaction between a supplier and a consumer of a good. Let's say they are producing and consuming organically grown apples. The supplier is one of several producers of apples, and the consumer is one of many consumers of apples. In the transaction, our apple eater receives the apples and in turn pays the farmer, as indicated by the lines. The supplier has absorbed many costs of production but is satisfied with the transaction because of the payment received from the consumer. The consumer is happy with the transaction because of the benefit derived from eating the apples. In such transactions, the producers and consumers bear all the costs and benefits. Suppliers pay all costs of production; no one else bears any costs or receives any benefits from engaging in production. Consumers receive the benefit of consumption; their consumption brings no costs or benefits to others.

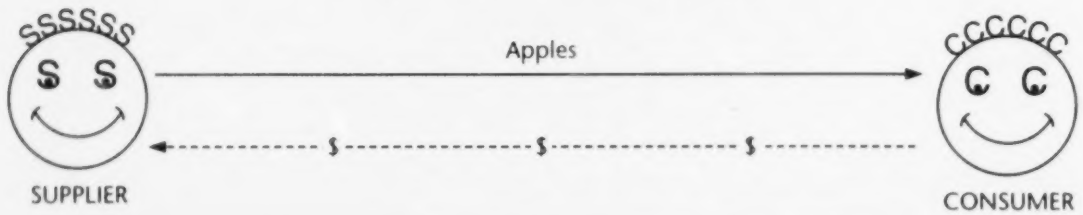
Organically grown apples are used in the transaction described above because real-world examples of products free from external benefits and costs are hard to find. If the apple farmer had used fertilizer and pesticide, many other people might have been affected. What might some of these effects have been?

External costs and external benefits are direct opposites of each other. If the external effect is negative, it is called a negative externality or an external cost. If the external effect is beneficial, it is called a positive externality or an external benefit.

We'll use Happy Faces and Sad Faces to illustrate third-party costs and benefits. Each illustration in the figure *Part A–External Costs of Production* and *Part B–External Benefits of Production* on the following page shows a supplier, a consumer, and a third party. The suppliers have Ss for hair and eyes, the consumers Cs, and the third parties Ts.

In *Part A–External Costs of Production*, the seller and consumer have happy faces. The consumer receives the product and pays the seller. Because this is a voluntary transaction, the consumer thinks the payment for the product is worthwhile. The seller also has a happy face since the payment provides an acceptable price for the product. However, Part A shows a third party who is sad because of a negative effect from production. An example of an external cost of production is pollution resulting from a manufacturing process. Let us suppose that in Part A the supplier's operations pollute air or water and the supplier does not prevent the pollution or clean it up afterward. Hence, the supplier's price does not include the cost of dealing with the pollution. The consumer also benefits because if the supplier's cost does not cover the cost of dealing with the pollution, the price to the consumer is lower than it otherwise would be. However, third parties who must now contend with dirtier air or more polluted water suffer increased costs such as health problems, reduced recreational opportunities, and higher taxes for water purification. Because the price of

Supplier and Consumer of Apples



Adapted from an exercise developed by John Pisciotta, Stevens Professor of Private Enterprise, Baylor University, Waco, TX.

ACTIVITY 64 continued

the product is lower than it would be if the supplier paid all the costs of dealing with the pollution, the unregulated market economy will produce too much of the product. In general, because third-party costs are not reflected in the market prices paid by buyers, goods or services that result in external costs will be overproduced in an unregulated market.

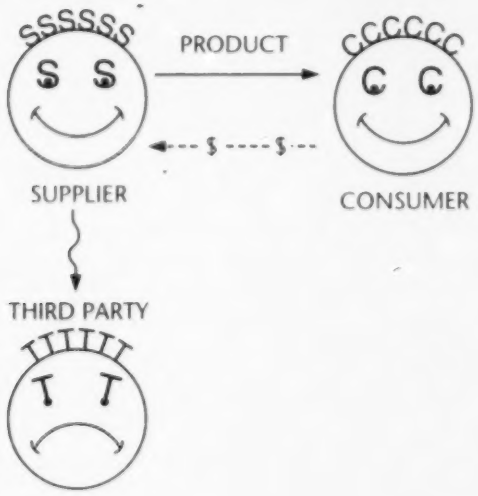
In *Part B–External Benefits of Production*, the external benefit again comes from a market transaction, but this time it brings a happy face to the third party, for in this instance, third parties benefit even though they pay none of the costs of producing the product. An example is a dam built to generate electric power. Among the third-party benefits might be flood control for downstream residents and a lake for recreation. People whose homes are no longer subject to floods or who fish, swim, and go boating in the lake would also benefit from the dam. However, in the absence of a subsidy or other nonmarket means of reducing producer costs, goods with external benefits tend to be underproduced in an unregulated market. Thus, if the dam must be paid for from electricity charges only, it might not be built, because the electricity charge alone may not be sufficient to permit the dam to operate at a profit.

Because an unregulated market overproduces products with external costs and underproduces products with external benefits, government may intervene to correct these situations. For instance, the government sometimes takes action designed to raise the price of products that impose external costs. It can require firms to meet certain pollution standards. This increases costs of production, decreases supply, and raises the equilibrium price. Less of the product will be produced than in an unregulated market. There also will be less pollution.

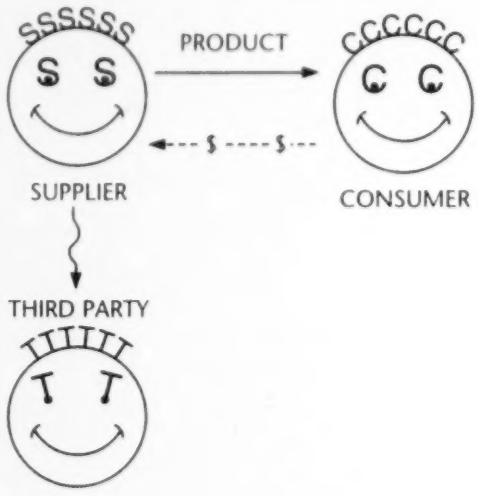
The government sometimes subsidizes the production of products with external benefits. If the government finances part of the cost of a hydroelectric dam, the dam may become practical to build. If the power company had to pay all the costs, it might not build the dam; consumer demand for a recreational lake is not reflected in the demand for electricity.

Private market decisions that are motivated by self-interest tend to ignore external costs and benefits. In those situations, a case may be made for government intervention.

Part A–External Costs of Production



Part B–External Benefits of Production



ACTIVITY 65

Externalities Worksheet

Part A. Third-party costs

1. Define negative externality or third-party cost.

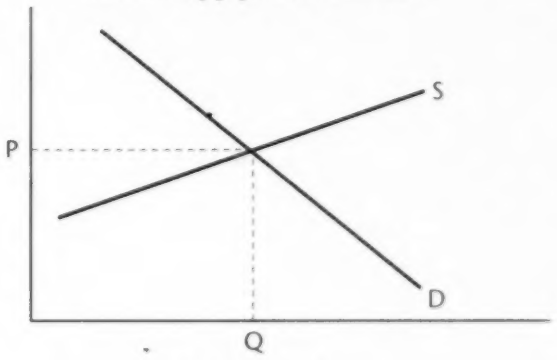
2. Give three examples of third-party costs.
   a.

   b.

   c.

3. In the graph *Steel—Supply and Demand,* only the private costs and benefits have been illustrated. Draw the new supply curve, and show the new equilibrium price and quantity for steel if the external costs of pollution were also counted as costs of production.

Steel—Supply and Demand



4. Would more or less steel be produced according to the new supply curve? _____

5. Would the price be higher or lower? _____

6. Why are products that entail third-party costs "over-produced"?

ACTIVITY 65 continued

Part B. Third-party benefits

1. Define positive externality or third-party benefit.

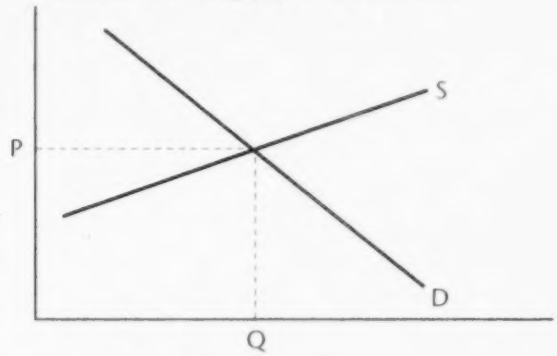
2. Give three examples of third-party benefits.
   a.

   b.

   c.

3. In the graph *Education—Supply and Demand,* only the private costs and benefits have been illustrated. Change the graph to show the new demand curve for education if all the third-party benefits to the community were counted as part of demand. Show the new equilibrium price and quantity.

Education—Supply and Demand



4. Would more or less education be produced according to the new supply curve? _____

5. Would the price be higher or lower? _____

6. Why may products that yield third-party benefits be "underproduced"?

ACTIVITY 66
What Would You Do?

1. A manufacturing plant pollutes a nearby river, much to the displeasure of the residents downstream. At a town meeting, residents discuss three proposals for solving the pollution problem. Pick the one you think is best and defend your answer.

   Proposal 1. Since the downstream residents will receive the benefits of pollution control, they should pay for it. This is a clear case of external benefits or positive externalities. A property tax should be placed on the residents downstream to cover the costs of pollution control.

   Proposal 2. The government should force the plant to close. That is the only way to stop all the pollution. There is no reason for the downstream residents to suffer. Any other solution still leaves some dirty water.

   Proposal 3. The company is not counting all of its costs of production. Keeping the river clean should be one of these costs. A tax, called an effluent tax, should be placed on the company for each cubic foot of water it contaminates.

2. The National League has awarded a new franchise for a baseball team to be established in Metropolis, but only if the new team, the Metropolis Superheroes, has a major league stadium in which to play. Metropolis will have to build a new stadium if a team is to be awarded a franchise in that city. Proponents argue that the team will generate new business, provide jobs, increase tax revenues, and promote tourism in Metropolis because of the greater national exposure. Opponents argue that most of the money spent on baseball games will be by Metropolis-area residents, who will simply reduce their spending on other things. Thus, there will be few new jobs, little increase in tax revenues, and few new tourists coming to Metropolis in the summer. Others say that the stadium, wherever it is located, will cause property values to go down and create traffic, parking, and noise pollution problems. Voters have three proposals before them. Using your knowledge of externalities, write a paragraph in support of each proposal. What assumption concerning external costs and benefits does each proposal make?

   Proposal 1. No city money should be used in the construction of the stadium.

   Proposal 2. The city should place a tax on each ticket sold to pay for the stadium.

   Proposal 3. The city should build the stadium and lease the right to play there to the baseball team at a subsidized rate.

From *Master Curriculum Guide in Economics: Teaching Strategies for High School Economics Courses*, (New York: National Council on Economic Education, 1985), p. 103.

ACTIVITY 67

Economic Efficiency and the Optimum Amount of Pollution Cleanup

The human and environmental damage caused by industrial pollution often arouses public attention. While it might be nice to restore our environment to its pristine state, pollution cleanup is costly, and dollars used for cleanup might be spent elsewhere. It seems, then, that some sort of balance must be struck between undesirable pollution and costly cleanup. Let's apply marginal analysis to determine an optimal amount of pollution and environmental cleanup.

The marginal social benefit of cleaning up pollution tends to decline as additional units of pollution are cleaned up. The marginal social cost of cleaning up pollution tends to increase as additional units of pollution are cleaned up. If society has accurate information about the total social (public and private) benefits and costs of various amounts of cleanup, it should be able to get as close as possible to the most efficient (or optimum) level of cleanup (and/or pollution) where the marginal social benefits equal the marginal social costs.

Imagine a community in which two firms emit foul sludge into two local lakes (one for each firm). Natural processes gradually break down the sludge, rendering it harmless. But as long as emissions continue, a certain "equilibrium" level of harmful sludge remains in the lake. If emissions are lowered, this equilibrium level will be reduced. The opposite occurs if emissions are increased. Currently each firm emits five units of sludge each week.

Given the information in the tables *Firm 1* and *Firm 2*, you should be able to determine the optimal level of emissions for this community. Fill in all of the blanks in the tables, and use this information to answer questions 1 through 4. Assume that benefits obtained and costs incurred for cleanup at one lake have no impact on costs and benefits at the other lake.

Firm 1

Reduction of Foul Sludge Emissions	Total Social Benefit of Cleanup	Marginal Social Benefit of Cleanup	Total Social Cost of Cleanup	Marginal Social Cost of Cleanup
0	0		0	
		350		160
1	350		160	
		_____		_____
2	650		370	
		_____		_____
3	900		630	
		_____		_____
4	1100		940	
		150		360
5	1250		1300	

1. Using the data from Firm 1, fill in the blanks and cross out the incorrect words in parentheses in each set underlined below.
   a. The marginal social benefit (MSB) of reducing emissions by the first unit of foul sludge is $ _____, and the marginal social cost (MSC) of reducing pollution emissions by the first unit is $ _____. The marginal social benefit (MSB) is *(greater than/equal to/less than)* the marginal social cost (MSC), so that it *(would/would not)* be economically efficient from society's perspective to require Firm 1 to reduce pollution emission by the first unit.
   b. The MSB of eliminating the last (fifth) unit of foul sludge is $ _____ and

Adapted from Phillip Saunders, *Introduction to Microeconomics: Student Workbook*, Fifteenth edition, Bloomington, IN, 1993. Copyright ©1993 Phillip Saunders. All rights reserved.

ACTIVITY 67 continued

the MSC of reducing pollution emissions by the last (fifth) unit is $ _____ . The MSB is *(greater than/equal to/less than)* the MSC so that it *(would/would not)* be economically efficient from society's perspective to require Firm 1 to reduce pollution emission by the fifth unit.

Firm 2

Reduction of Foul Sludge Emissions	Total Social Benefit of Cleanup	Marginal Social Benefit of Cleanup	Total Social Cost of Cleanup	Marginal Social Cost of Cleanup
0	0		0	
		350		160
1	350		160	
		300		160
2	650		320	
		250		160
3	900		480	
		200		160
4	1100		640	
		150		160
5	1250		800	

2. Using the data from Firm 2, fill in the blanks and cross out the incorrect words in parentheses in each set underlined below.
   a. The marginal social benefit (MSB) of eliminating the fourth unit of foul sludge is $ _____, and the marginal social cost (MSC) of reducing pollution emissions by that fourth unit is $ _____ . The MSB is *(greater than/equal to/less than)* the MSC so that it *(would/would not)* be economically efficient from society's perspective to require Firm 2 to reduce pollution emissions by four units.

   b. The MSB of eliminating the fifth (last) unit of foul sludge is $ _____, and the MSC of reducing pollution emissions by that fifth (last) unit is $ _____ . The MSB is *(greater than/equal to/less than)* the MSC so that it *(would/would not)* be economically efficient from society's perspective to require Firm 2 to reduce pollution emissions by five units.

ACTIVITY 67 continued

3. If this community decides to adopt a pollution control ordinance aimed at maximizing economic efficiency, how should it evaluate each of the following three proposals, all of which are based on the data presented above? Write a brief economic evaluation in the space provided after each of the following proposals. Be sure to use the concepts of marginal social benefit and marginal social cost in your analysis.

   Proposal A. "Foul sludge emissions should be reduced (by five units) to zero in each firm because we should eliminate all pollution from our lakes regardless of the cost." This proposal *(would/would not)* maximize *economic efficiency,* because:

   Proposal B. "Firm 2 should be forced to reduce emissions (by five units) to zero because the total social benefit of cleanup ($1,250) exceeds the total social cost of cleaning up ($800). But Firm 1 should not be forced to clean up at all, because the total social benefit of clean up ($1,250) is less than the total social cost of reducing emissions to zero ($1,300)." This proposal *(would/would not)* maximize economic efficiency, because:

   Proposal C. "In the interest of equal treatment for all, each firm should be forced to clean up (reduce emissions) by three units." This proposal *(would/would not)* maximize economic efficiency because:

4. Using the data presented above, what do you think is the optimum level of emissions reduction for each firm?

   Firm 1 _____ units.

   Firm 2 _____ units.

   Explain briefly why you chose the numbers that you did.

ACTIVITY 68
Free-Market Environmentalism

According to economic theory, markets work well when buyers and sellers receive all the benefits and pay all the costs. Under these conditions, voluntary trade between buyers and sellers promotes economic progress. Trade helps all of us get more of what we want, moves goods and services from people who value them less to those who value them more, and channels people's self-interest into social cooperation. People trade only if the benefits of a trade are greater than the costs—if you do something good for me, I'll do something good for you.

What happens if buyers and sellers don't bear all the costs? What if a seller lowers his or her costs by dumping toxic waste in an ordinary landfill? The seller may earn higher profits, and buyers may pay a lower price, but people living near the landfill may develop health problems. This means third parties bear some of the costs.

Government to the Rescue

To correct the problem, government in many cases intervenes by persuading or forcing buyers and sellers to pay all of the costs. It forbids the dumping of toxic waste and forces sellers to pay for environmental damage. It persuades people to change their preferences and care more about the environment. It makes the appeal that selfishness should be replaced by more concern for the common good. Consumers and producers are asked to sacrifice in order to have a cleaner environment. Laws are passed to require this sacrifice.

Property and Incentives

Some economists now reject the idea that environmental damage occurs because of market failures. Free-market environmentalists see environmental damage as a private-property failure. The problem is that no one owns the environment so there are few incentives to preserve it. For example, why are there campaigns to save whales but no campaigns to save pigs, cows, or sheep? No one owns the whales, but ownership provides an incentive to preserve pigs, cows, and sheep for future generations.

Incentives matter. The key to saving the environment is to set up an incentive system that channels self-interest into social cooperation. Instead of being shocked that people follow their own interest, government can use self-interest to save the environment. If property rights can be assigned to the environment, the owners would have an incentive to clean up their property. Economists are almost universally in favor of using market-based incentives to lower pollution.

Many environmentalists view a clean environment as a human right. David Doniger, a lawyer for the National Resources Defense Council, put it this way: "We take the view that there are rights involved here, rights to be protected regardless of the cost involved."

Economists believe this attitude not only increases the cost of cleaning up the environment but also causes more pollution than we need to accept. Economists view a clean environment as an economic good, which has benefits and costs like any other economic good or service. The key is to obtain a cleaner environment at the lowest opportunity cost. Alan S. Blinder, Vice Chairman of the Federal Reserve Board of Governors, stated:

> Even where pollutants can be life-threatening it makes little sense to pursue cleanup "regardless of cost," crass as that may sound. For example, a Harvard physicist estimated that a particular benzene standard proposed by the Occupational Safety and Health Administration (OSHA) might save at most one life every three years, at an annual cost of more than $100 million per year. Human life may be sacred, but can society really afford to spend more than $300 million to save a single life? Wouldn't the same money save many more lives if it were spent on improved highway guard rails, or on organ transplants, or on more policemen?

To economists, a cleaner environment is a "more or less" problem, rather than a "yes or no" problem.

Pollution Will Cost You

Portions of this essay are from the Teacher's Guide, *The Wall Street Journal Classroom Edition*, April 1994, and Alan Blinder, *Hard Heads, Soft Hearts*, Addison Wesley, 1988.

ACTIVITY 68 continued

Economists see the pollution problem as one in which polluters are allowed to pollute at too low a cost. The solution is to charge more for the right to pollute and then allow markets to work at cleaning up the environment. Here is Alan Blinder's explanation:

> This analysis of why the market fails suggests the remedy that economists have advocated for decades: charge polluters for the value of the clean air or water they now take for free. That will succeed where the market fails because an appropriate fee or tax per unit of emissions will, in effect, put the right price tag on clean air and water—just as the market now puts the right price tag on oil and steel. Once our precious air and water resources are priced correctly, polluters will husband them as carefully as they now husband coal, labor, cement, and steel. Pollution will decline. The environment will become cleaner and more healthful.

This goal can be accomplished either by taxing pollution or by creating a marketable pollution permit. Taxing pollution involves putting a tax on every pound or ton of pollution dumped into the air or water. The tax would have to be high enough so that businesses would work to develop technologies to avoid the tax. The government would set the level of the tax and monitor the pollution rather than command that every firm reach the same level of pollution regardless of cost. Second, the government could set up a market in pollution rights. The command and control system does not reward firms that exceed environmental standards. Under command and control, there usually is one standard regardless of the marginal cost of cleaning up the pollution. Even firms with low marginal costs of pollution cleanup have no incentive to go beyond that standard. But what if firms could sell pollution rights to other firms that cannot meet the standard because they do not have the technology or because of high marginal cleanup costs? Once again the government could set the standard. Firms that exceed the standard could sell their pollution rights to firms that cannot meet the standard. Now each company has an incentive to use the least-cost method to clean up pollution.

Cheaper Is Sometimes Better

How much would market-based incentives help us in cleaning up the environment? Almost all studies indicate that they would provide a much cleaner environment at a lower cost. Alan S. Blinder concludes:

> The overall conclusion is clear. Despite vast differences from case to case, a change from a system of command and control to either effluent fees or marketable pollution permits would reap a huge social dividend. A very conservative estimate, based on these studies, is that the nationwide costs for pollution abatement would be reduced by one-third with no increase in pollution. Larger savings are likely. In fact one expert has speculated that cost savings might run as high as 80 percent once the profit motive had led to cheaper pollution-control technologies. Since the nation now spends more than $\$70$ *billion* per year on reducing pollution, the potential savings are perhaps $23 billion per year—and could run as high as $50 billion. That sum ought to be enough to get someone's attention.

1. Why doesn't the market automatically clean up the environment?

ACTIVITY 68 continued

2. What is wrong with the command and control system of cleaning up the environment? Why shouldn't every business, home, or car meet the same environmental standard? (Hint: Refer to Activity 67 for an answer.)

3. Explain why taxing pollution can cause firms to clean up their pollution. Use costs and benefits in your answer.

4. Explain why establishing marketable pollution permits will help clean up the environment. Use costs and benefits in your answer.

5. True, false, or uncertain, and why? "We cannot give anyone the option of polluting for a fee."

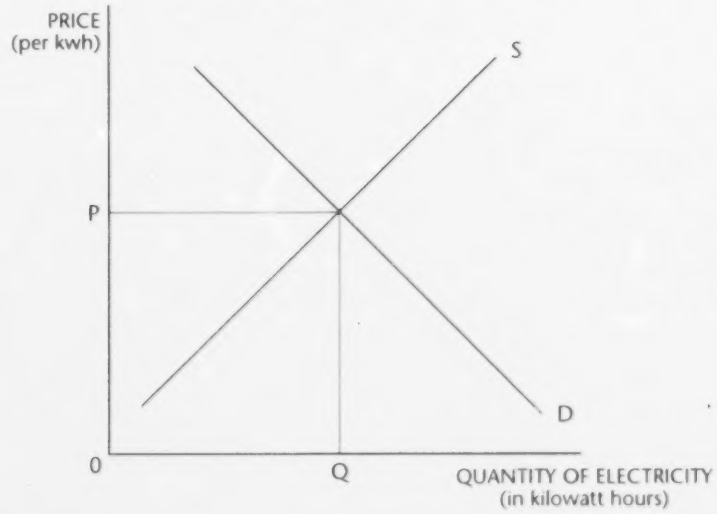
ACTIVITY 69

Paying To Use A Scarce Resource: Carbon and Sulfur Taxes

Consider the market for electricity as depicted by the graph *Price and Quantity of Electricity*. The demand curve reflects what consumers are willing and able to pay for electricity while the supply curve reflects the costs of the resources used to produce electricity, for example: natural (oil, coal, natural gas), capital (power plant, transmission lines, maintenance trucks), and human (coal miners, technicians, managers, engineers).

If a fossil fuel is burned to create the electricity, virtually all of the fuel exits as emissions from the power plant in the form of gases and particulates, including carbon dioxide and sulfur dioxide. Carbon dioxide has been identified as a potential culprit in global warming. Sulfur dioxide emissions can lead to acid rain. In other words, these emissions may result in the loss of some environmental quality. The value of this loss of environmental quality is thus another cost to society of producing electricity. Without some kind of intervention, however, this cost would not likely be reflected in the supply curve for electricity.

Price and Quantity of Electricity



Suppose now the government places a tax on each pound of carbon emitted and another on each pound of sulfur emitted.

Based on this information, answer the following questions:

1. How are these taxes like the payments for the other resources used in the production of electricity?

2. How would these charges affect the demand and/or supply curves in the graph *Price and Quantity of Electricity*?

Activity developed by Gregory Breuner, Lakeridge High School, Lake Oswego, OR, and Mary Jo Thomas, South Eugene High School, Eugene, OR.

ACTIVITY 69 continued

3. How would this affect the equilibrium quantity of electricity produced and its equilibrium price?

4. How would this affect the amount of carbon and sulfur emissions?

5. How might these charges lead to changes in the way electricity is produced?

ACTIVITY 70
Public-Choice Economics

Government has important economic functions, but local, state, and federal governments often perform these functions poorly. Even though political leaders are elected by the people, they often ignore the wishes of the people and promote the agendas of special-interest groups. Economists from the public-choice school of economics believe the politicians are following their own self-interest and governmental decisions make sense when viewed through the public-choice theory lens. Even though the politicians' behavior is rational, the results of these public policy choices may be harmful for the economy.

Nobel Prize Winning Theory

In 1986, James Buchanan, a professor at George Mason University and leading critic of politicians, received the Nobel Prize for economics for his theory of governmental decision making. Alan Meltzer, an economist at Carnegie-Mellon University, summarized Mr. Buchanan's theory in an article.*

> He started a whole new field of political economy. Economic theory was concerned with the government's choices of policy. It didn't think about the mechanism that would cause a policy to be adopted. What Mr. Buchanan did was to put the best parts of political science and economics together.
>
> Economists generally had adopted a good-will theory of government. Jim Buchanan believes that politicians make decisions the same way other people do—by first thinking of their own interests, which may not be the same as the public's interest.

Thus, politicians and government officials are as self-interested as business people. But instead of trying to maximize profits, "political entrepreneurs" seek to maximize power, salaries, prestige, and votes. In the private market, competition channels self-interested behavior into the public good. Adam Smith [1723-1790] said that an individual's self-interested behavior was "led by an invisible hand to promote an end which was no part of his intention. Nor is [this] always the worse for society....By pursuing his own interest he frequently promotes [the interest] of the society more effectually than when he really intends to promote it." Mr. Buchanan maintains that the political "invisible hand" has different effects from those of the invisible hand of the marketplace. According to public-choice economics, concentrated special interests usually prevail over the public good in any given issue because special interests get a big benefit while each citizen has a small loss. This is true even though the total public loss is greater than the benefits to special interests. The only exception is when the public has a strong opinion on the issue and follows the way legislators vote on it. The political invisible hand thus explains why governments have huge budget deficits, why special-interest groups prevail over majority opinion, why bureaucracies expand, and why governments often protect the interests of businesses over consumers.

What would you do?

1. You are a candidate for Congress. Half the voters in your district favor a certain government policy and half oppose it. What position will you take on the issue? Why?

Activity adapted from Teacher's Guide to Accompany Posters, *The Wall Street Journal Classroom Edition*, Sept. 1994

**The Wall Street Journal*, Oct. 17, 1986.

ACTIVITY 70 continued

2. You won your election to Congress. A majority of voters in your district favor gun control. However, the National Rifle Association is fighting gun control, and if you vote against gun control, it will make a large financial contribution to your next campaign and provide campaign workers. How will you vote on gun control bills? Why?

3. In fiscal year 1994, Social Security and Medicare were expected to account for $464.1 billion or 31.3 percent of total federal expenditures. As a member of Congress, you realize that the budget cannot be balanced unless laws are passed that allow for cuts in these programs. However, 20 percent of your constituents receive Social Security payments. Many of them are also members of the American Association of Retired People, a lobbying group that supports members of Congress who are against cutting Social Security. Will you support enacting new laws that would cut Social Security programs? Why or why not?

4. Your constituents believe that they should get a better return on their tax dollars. Of the taxes sent to Washington, your Congressional district is not getting enough back to fund projects locally. A new research facility for energy technology is proposed, and your district is in the running for it. Other members of Congress will support a bill to put the laboratory in your district if you support programs for their districts. However, you are a founding member of Porkbusters, a caucus group committed to cutting unnecessary federal spending. Will you make the deals necessary to get the energy research lab for your district? Why or why not?

5. You lost your attempt to be re-elected to Congress, but you got a job as a bureaucrat in the Department of Education. You are in charge of collecting information about schools. You are aware of efficient computer technology that would make the collection of this information quicker and less expensive. However, this would mean that several people under your supervision will lose their jobs. You know that your status, power, and salary depend on the size of your department. There are no profits in government. Will you push for the adoption of the new technology? Why or why not?

ACTIVITY 71

Solving the Mysteries of Government

Answer the following questions using ideas from the public-choice theory of government.

1. In fiscal year 1995, the federal budget deficit was over $200 billion, and the national debt was about $5 trillion. Yet nearly every politician is in favor of cutting the deficit and reducing the debt. Then why don't Congress and the President do it?

2. Why would the government impose a tax that would cause thousands of people to lose their jobs while at the same time raising little or no revenue?

3. If free trade improves a nation's standard of living, why do so many countries have tariffs, quotas, and other barriers to trade?

4. Farm price supports cost taxpayers billions of dollars each year. The purpose of farm price supports is to raise the price of agricultural products, which costs consumers more money. Direct payments to dairy farmers alone cost taxpayers a lot of money. In Florida in a recent year, dairy farmers received $40.3 million in price support payments. Most of this money went to 177 farmers. Each of these farmers received an average payment of $226,000. In a recent year, a bill was introduced in Congress to lower price supports for dairy farmers. Even though 55 percent of milk production takes place in five states and even though a majority of Congressional districts have no dairy farmers, the bill was soundly defeated. Why?

5. Farming occurs in 16 percent of the 3,042 counties in the United States. Nevertheless, the U.S. Department of Agriculture maintains 11,000 offices in 2,859 counties; this is 94 percent of the counties in the United States. In 1950, there were ten million farmers and 84,000 employees in the Department of Agriculture. In 1990, there were 2.9 million farmers and 129,000 employees in the Department of Agriculture. If this trend continues, by 2000, there will be 145,000 farmers and 146,000 employees in the Department of Agriculture. How could this happen?

Questions 4 and 5 adapted from Roger LeRoy Miller, *Economics Today*, (New York: HarperCollins College Publishers, 1994), Chap. 27.

ACTIVITY 72
What Is a Fair Tax?

Almost everyone is concerned about how much we pay in taxes. The best way to determine how much tax you pay is to state your tax as an *effective tax rate*. An effective tax rate is the percentage of your income you pay in taxes. This differs from a *nominal tax rate* or *legal tax rate*. For example, a sales tax rate may be five percent (the nominal rate), but this does not mean that all people pay out five percent of their income in sales taxes. Outlays for rent, insurance, medical bills, among other things, are not subject to sales taxes. Neither, of course, are savings.

Let's look at the effective tax rate of Joanne Walters. If she made $10,000 a year and paid $2,000 in taxes, her effective tax rate would be twenty percent. You can figure this by dividing $2,000 by $10,000:

$$\frac{\$\ 2{,}000}{\$10{,}000} = 20\%$$

Taxes may have three kinds of effective tax rates. If a tax is *progressive*, the effective tax rate increases as a person's income goes up. For example, a person who makes $10,000 a year may have an effective tax rate of ten percent, while a person who makes $15,000 a year may have an effective rate of 18 percent.

If a tax is *proportional*, the effective tax rate stays the same regardless of income. In this case, a person making $10,000 a year and a person making $15,000 a year both would be taxed at an effective rate of 10 percent. Of course, the person making $15,000 a year would pay more total dollars in taxes. A proportional tax is sometimes called a flat tax.

If a tax is *regressive*, the effective tax rate decreases as income goes up. For example, a person making $10,000 a year might pay an effective tax rate of ten percent, while a person who makes $15,000 a year might pay an effective tax rate of eight percent.

Now answer these questions to see if you understand progressive, proportional, and regressive tax rates. Fill in the answer blanks or cross out the incorrect words in parentheses. Then provide longer answers when required.

1. A tax where each person pays three percent regardless of income is a _____ tax.

2. A tax levied at one percent on the first $1,000 of income, two percent on the next $1,000, and so on is a _____ tax.

3. A tax levied at 15 percent on the first $1,000 of income, 12 percent on the next $1,000, and so on is a _____ tax.

4. If it is true that a person with an income of $20,000 a year typically buys six packs of cigarettes per week and a person with an income of $40,000 typically buys nine packs of cigarettes per week, this suggests that an excise tax of ten cents per pack would be a _____ tax. Explain.

From Thomas Swartz, John Roos, and John Morton, *Analyzing Tax Policy: A Resource Guide* (New York: National Council on Economic Education, 1979), p. 36.

ACTIVITY 72 continued

5. Rick Morales has an income of $25,000 and spends it all on taxable goods. Chet Burton has an income of $50,000 but spends only $40,000 on taxable goods. Assuming an eight percent sales tax, Mr. Morales will pay $_____ in sales taxes, which is _____ percent of his total income. On the other hand, Mr. Burton will pay $_____ in sales taxes, which is _____ percent of his total income. Therefore, we can conclude that the sales tax is _____.

6. Since the sales tax has the same nominal or legal rate based on sales, why is it regressive? What steps could be taken to make it less regressive?

7. Most people in the United States pay Social Security taxes. The employee's rate in 1994 was 6.2 percent on the first $60,600 of income. All income in excess of $60,600 was not taxed for Social Security purposes.
   a. What was the effective Social Security tax rate in 1994 for a person earning $20,000 a year? _____
   b. What was the effective Social Security tax rate for a person earning $60,600? _____
   c. What was the effective Social Security tax rate for a person earning $121,200? _____
   d. Therefore, the Social Security tax is a *(progressive/proportional/regressive)* tax up to $60,600 of income. For incomes above _____, the Social Security tax is *(progressive/proportional/regressive)*.
   e. In addition to the Social Security tax, people must pay 1.45 percent of their income for Medicare benefits. There is no income limit on the Medicare tax. Does this make the total tax for Social Security and Medicare more or less regressive? Why?

8. Do you think the fairest tax is progressive, proportional, or regressive? Why?

ACTIVITY 73
Excise Taxes

Suppose the following graph and table show the current supply of Greebes.

Current Supply Schedule of Greebes

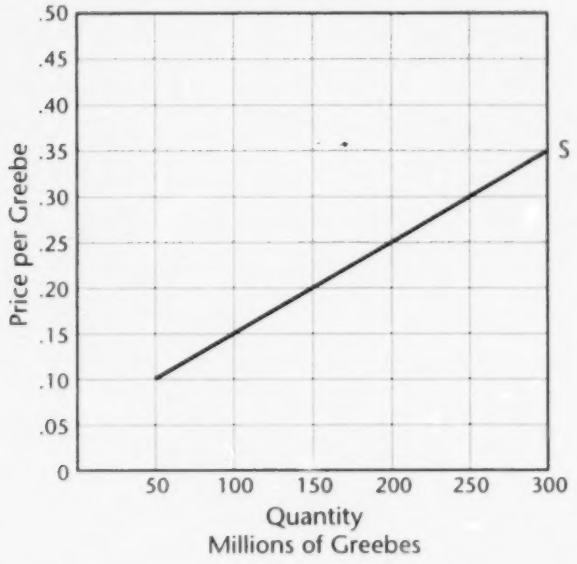


Table of Current Supply Schedule of Greebes

Quantity (millions)	Supply price before tax ($ per Greebe)	Supply price after tax ($ per Greebe)
50	$.10	_____
100	.15	_____
150	.20	_____
200	.25	_____
250	.30	_____
300	.35	_____

Now suppose that (to raise revenue for higher education) the government enacts an excise (sales) tax of $.15 per Greebe. *This tax will result in a new supply curve for Greebes.* To determine where this new supply curve lies, reason as follows: If before the tax, firms were willing to supply 50 million Greebes at a price of $.10, they would now be willing to supply 50 million Greebes only if the price were $.25. (Remember: $.15 of the price of each Greebe sold is now going to go to the government. So, if the price is $.25 and the government is getting $.15 of this price, then the seller is receiving the remaining $.10.)

Fill in the blank spaces in the table and draw in the new supply curve resulting from the tax. Label the new supply curve S_T.

What will be the result of this excise (sales) tax on: The equilibrium quantity of Greebes? The equilibrium price paid by buyers (*Pb*)? The equilibrium price received by sellers (*Ps*)? The revenue received by the government? And the income or revenue received by sellers after the tax?

The answers to these important questions will depend on the nature of the demand for Greebes. The next section of this Activity will help you determine the effects of a $.15 excise tax on Greebes under four different demand conditions. After you have completed these, there are some additional, less mechanical, questions for you to think about and answer.

Adapted from Phillip Saunders, *Introduction to Microeconomics: Student Workbook*, Fifteenth edition, Bloomington, IN, 1993.
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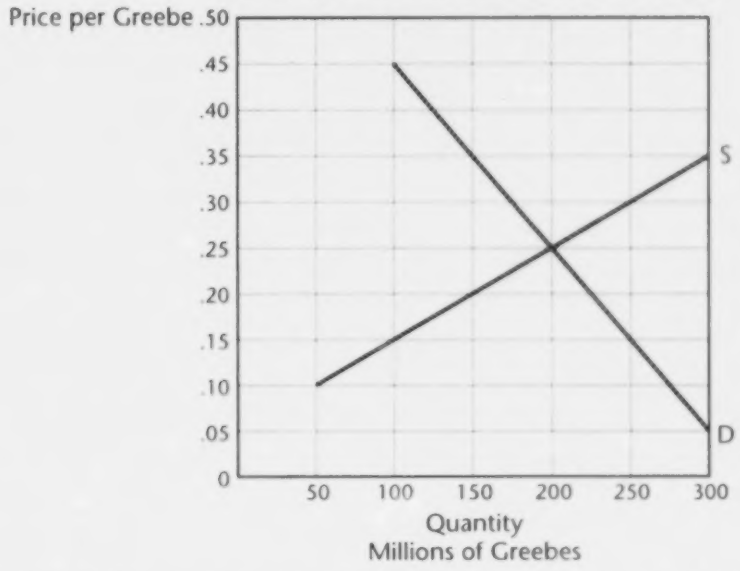
ACTIVITY 73 continued

Part A.

Relatively Inelastic Demand for Greebes



1. On the graph *Relatively Inelastic Demand for Greebes,* the equilibrium quantity of Greebes is _____ million.

2. On the graph, the equilibrium price of Greebes is $ _____ per Greebe.

3. Buyers are spending a total of $ _____ million on Greebes.

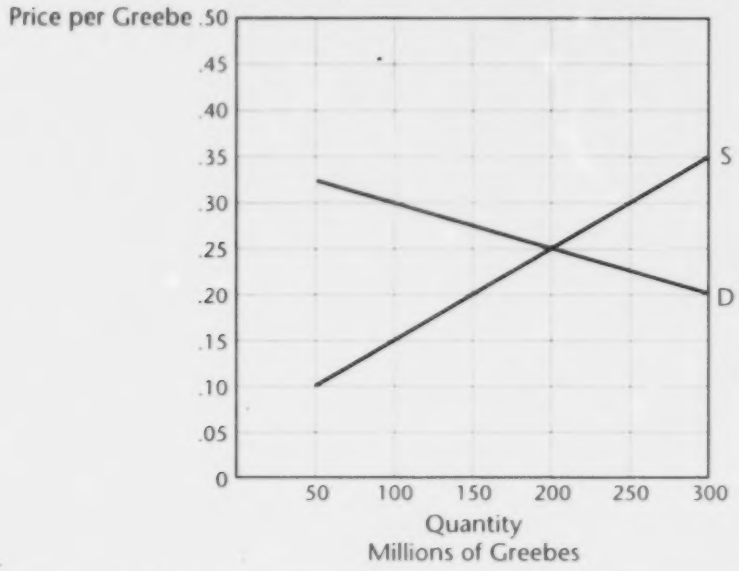
4. Sellers are receiving a total of $ _____ million from selling Greebes.

5. If an excise tax of $.15 per Greebe sold is levied on the sellers of Greebes, the equilibrium price paid by buyers (P_b) will differ from the equilibrium price received by sellers (P_s) by the amount of the tax. This $.15 goes to the government. Under these circumstances:
   a. The new equilibrium quantity of Greebes would be _____ million.
   b. The new equilibrium price paid by buyers would be $ _____ per Greebe.
   c. The new equilibrium price received by sellers (after tax) would be $ _____ per Greebe.
   d. Buyers would spend a total of $ _____ million on Greebes.
   e. Sellers would receive a total of $ _____ million (after tax) from selling Greebes.
   f. The government revenue from this tax would be $ _____ million.
   g. $ _____ million of this revenue would be paid by buyers in the form of higher prices.
   h. $ _____ million of this revenue would be paid by sellers in the form of reduced income.
   i. As a result of the tax, buyers might buy a smaller quantity than before the tax. If so, the sellers would also have a loss of revenue that is not collected by the government. In this case, the "uncollected revenue loss" would be equal to $ _____ million.

ACTIVITY 73 continued

Part B.

Relatively Elastic Demand for Greebes



1. On the graph *Relatively Elastic Demand for Greebes*, the equilibrium quantity of Greebes is _____ million.

2. On the graph, the equilibrium price of Greebes is $ _____ per Greebe.

3. Buyers are spending a total of $ _____ million on Greebes.

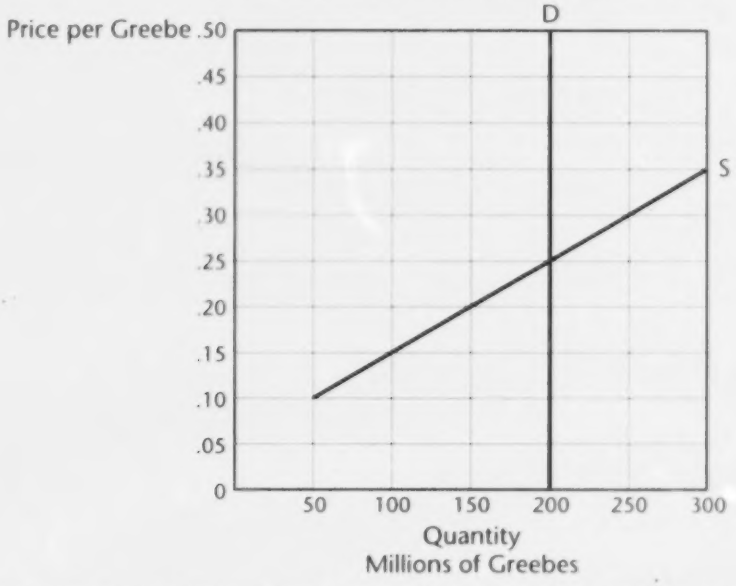
4. Sellers are receiving a total of $ _____ million from selling Greebes.

5. If an excise tax of $.15 per Greebe sold is levied on the sellers of Greebes, the equilibrium price paid by buyers (P_b) will differ from the equilibrium price received by sellers (P_s) by the amount of the tax. This $.15 goes to the government. Under these circumstances:
   a. The new equilibrium quantity of Greebes would be _____ million.
   b. The new equilibrium price paid by buyers would be $ _____ per Greebe.
   c. The new equilibrium price received by sellers (after tax) would be $ _____ per Greebe.
   d. Buyers would spend a total of $ _____ million on Greebes.
   e. Sellers would receive a total of $ _____ million (after tax) from selling Greebes.
   f. The government revenue from this tax would be $ _____ million.
   g. $ _____ million of this revenue would be paid by buyers in the form of higher prices.
   h. $ _____ million of this revenue would be paid by sellers in the form of reduced income.
   i. As a result of the tax, buyers might buy a smaller quantity than before the tax. If so, the sellers would also have a loss of revenue that is not collected by the government. In this case, the "uncollected revenue loss" would be equal to $ _____ million.

ACTIVITY 73 continued

Part C.

Perfectly Inelastic Demand for Greebes



1. On the graph *Perfectly Inelastic Demand for Greebes,* the equilibrium quantity of Greebes is _____ million.

2. On the graph, the equilibrium price of Greebes is $ _____ per Greebe.

3. Buyers are spending a total of $ _____ million on Greebes.

4. Sellers are receiving a total of $ _____ million from selling Greebes.

5. If an excise tax of $.15 per Greebe sold is levied on the sellers of Greebes, the equilibrium price paid by buyers (P_b) will differ from the equilibrium price received by sellers (P_s) by the amount of the tax. This $.15 goes to the government. Under these circumstances:
   a. The new equilibrium quantity of Greebes would be _____ million.
   b. The new equilibrium price paid by buyers would be $ _____ per Greebe.
   c. The new equilibrium price received by sellers (after tax) would be $ _____ per Greebe.
   d. Buyers would spend a total of $ _____ million on Greebes.
   e. Sellers would receive a total of $ _____ million (after tax) from selling Greebes.
   f. The government revenue from this tax would be $ _____ million.
   g. $ _____ million of this revenue would be paid by buyers in the form of higher prices.
   h. $ _____ million of this revenue would be paid by sellers in the form of reduced income.
   i. As a result of the tax, buyers might buy a smaller quantity than before the tax. If so, the sellers would also have a loss of revenue that is not collected by the government. In this case, the "uncollected revenue loss" would be equal to $ _____ million.

ACTIVITY 73 continued

Part D.

Perfectly Elastic Demand for Greebes

1. On the graph *Perfectly Elastic Demand for Greebes,* the equilibrium quantity of Greebes is _____ million.

2. On the graph, the equilibrium price of Greebes is $ _____ per Greebe.

3. Buyers are spending a total of $ _____ million on Greebes.

4. Sellers are receiving a total of $ _____ million from selling Greebes.

5. If an excise tax of $.15 per Greebe sold is levied on the sellers of Greebes, the equilibrium price paid by buyers (P_b) will differ from the equilibrium price received by sellers (P_s) by the amount of the tax. This $.15 goes to the government. Under these circumstances:
   a. The new equilibrium quantity of Greebes would be _____ million.
   b. The new equilibrium price paid by buyers would be $ _____ per Greebe.
   c. The new equilibrium price received by sellers (after tax) would be $ _____ per Greebe.
   d. Buyers would spend a total of $ _____ million on Greebes.
   e. Sellers would receive a total of $ _____ million (after tax) from selling Greebes.
   f. The government revenue from this tax would be $ _____ million.
   g. $ _____ million of this revenue would be paid by buyers in the form of higher prices.
   h. $ _____ million of this revenue would be paid by sellers in the form of reduced income.
   i. As a result of the tax, buyers might buy a smaller quantity than before the tax. If so, the sellers would also have a loss of revenue that is not collected by the government. In this case, the "uncollected revenue loss" would be equal to $ _____ million.

ACTIVITY 73 continued

Part E.

1. A famous Supreme Court justice once said: "The power to tax is the power to destroy [sellers]." This is more likely to be true the more the demand for the product taxed is relatively *(elastic/ inelastic)*. (Cross out the incorrect word.)

2. If you were a government revenue agent interested in getting the most tax revenue possible, you would suggest putting excise taxes on goods whose demand is *(elastic/unit elastic/inelastic)*. (Cross out the incorrect word.)

3. Think of some real-world goods on which excise taxes are placed (e.g., liquor, cigarettes, gasoline). Do you think that the demand for these goods is relatively elastic or relatively inelastic? Why?

4. In this problem the price elasticity of supply has been held constant in all four cases. How might a change in the price elasticity of supply affect the results of imposing an excise tax? Why?

Part F.

Consider the newspaper quotation and the questions that follow. You do not have to write out answers to the questions, but you should thoughtfully consider them for class discussion.

> "The city is planning to place a 10% tax on auto parking. The tax would fall on every motorist who uses a space in either the garages and the lots operated by the Public Parking Authority or in privately operated lots and garages."

1. Draw the demand curve and the long-run supply curve for parking lots. Explain why each has the shape you show, i.e., why each is relatively elastic or inelastic.

2. Given the curves you have drawn in 1, show the effect of introducing a 10% tax; i.e., how does the equilibrium position after imposition of the tax compare with the initial equilibrium position?

3. The newspaper quotation implies that the "burden" of the tax will fall entirely upon the driver. Is this true for the case you have developed in 1 and 2 above? Under what circumstances would it be true?

Sample Multiple-Choice Questions

Circle the letter of each correct answer.

1. A public good is characterized by which of the following?

   I. People who do not pay for the good can be excluded from using it.
   II. If one person uses the good, it does not reduce its usefulness to others.
   III. It is easy to determine who must pay the costs of the good.

   a. I only
   b. II only
   c. III only
   d. II and III only
   e. I, II, and III

2. Public goods are those that:
   a. The government wants to produce.
   b. Provide more benefits than costs.
   c. Have inelastic demand curves.
   d. Are produced most efficiently by many sellers.
   e. Are difficult or impossible to exclude non-buyers from using.

3. Which of the following best meets the criteria of a public good?
   a. A golf course
   b. National defense
   c. Electric power
   d. A campground
   e. A college education

4. Which of the following is/are considered economic functions of government?

   I. Enforcing laws and contracts
   II. Providing public goods
   III. Correcting market failures

   a. I only
   b. II only
   c. III only
   d. II and III only
   e. I, II, and III

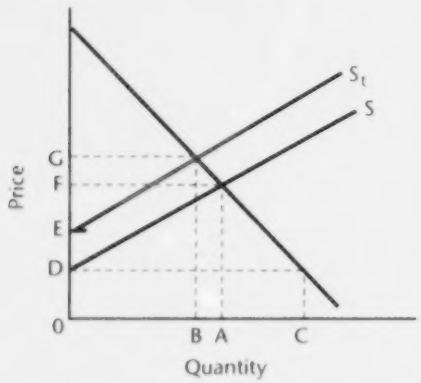
5. In a market economy, the distribution of income is:
   a. Equitable because people willing to work earn income.
   b. Primarily determined by the prices of scarce resources owned by people.
   c. Determined mostly by government by using its power to tax.
   d. Distributed on the basis of need.
   e. Essentially unchanged in the last 100 years.

6. If the production of a good creates negative externalities, the private market will produce:
   a. Too much of the good at too low a price.
   b. Too much of the good at too high a price.
   c. Too little of the good at too high a price.
   d. Too little of the good at too low a price.
   e. The right amount of the good at the correct price.

SAMPLE MULTIPLE-CHOICE QUESTIONS continued

7. If the production of a good creates positive externalities, the private market will produce:
   a. Too much of the good at too high a price.
   b. Too little of the good at too low a price.
   c. Too little of the good at too high a price.
   d. Too much of the good at too low a price.
   e. The right amount of the good at the correct price.

Use the supply and demand graph below to answer questions 8–11. In the graph, point A is the current equilibrium level of output of this product, and point B is the optimal level of output from society's perspective. S is the supply curve without a tax, and S_t is the supply curve with a tax.



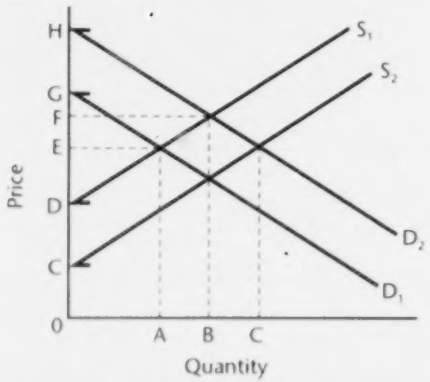
8. The figure above indicates that there is/are:
   a. Spillover benefits from the production of this product.
   b. Spillover costs from the production of this product.
   c. An underallocation of resources to the production of the product.
   d. Positive externalities from the production of the product.
   e. No spillover costs or benefits.

9. The external cost to society from the production of this product is measured by:
   a. *DE* b. *EF* c. *FG* d. *AB* e. *AC*

10. One solution to this externality problem is to:
    a. Give consumers a subsidy of the amount *FG*.
    b. Give producers a subsidy of the amount *AB*.
    c. Tax producers by the amount *DE*.
    d. Tax consumers by the amount *EF*.
    e. Tax consumers by the amount *DG*.

11. If the government corrects this externality problem with a tax so that all the costs are included in the cost of production, then the product price will be set at point:
    a. *A* b. *D* c. *E* d. *F* e. *G*

Use the supply and demand graph below to answer questions 12–16. Point A represents the current equilibrium level of output of this product, and point B represents the optimal level of output from society's perspective.



12. This supply and demand graph indicates that there is/are:
    a. Spillover benefits from the production of this product.
    b. Spillover costs from the production of this product.
    c. An overallocation of resources to the production of this product.
    d. A negative externality from the production of this product.
    e. No spillover costs or benefits to society.

Questions 8-16 were adapted from William Walstad, Test Bank II to Accompany McConnell and Brue, *Economics*, pp. 83-85.

SAMPLE MULTIPLE-CHOICE QUESTIONS continued

13. If government decides to correct this externality with a subsidy to consumers, then:
    a. The demand curve will shift from D_2 to D_1.
    b. The supply curve will shift from S_1 to S_2.
    c. The demand curve will shift from D_1 to D_2.
    d. The supply curve will shift from S_2 to S_1.
    e. None of the above will occur.

14. If government decides to correct this spillover problem by subsidizing producers, then:
    a. The demand curve will shift from D_1 to D_2.
    b. The supply curve will shift from S_1 to S_2.
    c. The supply curve will shift from S_2 to S_1.
    d. The demand curve will shift from D_2 to D_1.
    e. None of the above will occur.

15. The amount of the subsidy to be given to producers to correct this externality problem would be:
    a. *AB* b. *BC* c. *CD* d. *GH* e. *AC*

16. The amount of the subsidy to be given to consumers to correct this externality problem would be measured by:
    a. *AB* b. *BC* c. *CD* d. *GH* e. *OA*

17. The economist's position on allocating resources to control pollution is:
    a. All forms of air and water pollution should be eliminated.
    b. Government policies to reduce pollution have zero opportunity costs.
    c. Pollution should be reduced to the point where the marginal social cost of pollution control equals the marginal social benefit of pollution control.
    d. The amount of pollution control should be based on a comparison of the total costs and benefits, not marginal costs and benefits.
    e. The amount of pollution control should be based on a comparison of average costs and benefits, not marginal or total costs and benefits.

18. Public-choice theory is based on the idea that:
    a. Self-interest motivates participants only in the private sector of the economy.
    b. Self-interest motivates participants only in the public sector of the economy.
    c. Self-interest motivates participants in both the public and private sectors of the economy.
    d. The interests of society are the main interest of participants in the public sector of the economy.
    e. The interests of society are the main interest of participants in the private sector of the economy.

SAMPLE MULTIPLE-CHOICE QUESTIONS continued

19. With which of the following statements would advocates of public-choice theory agree?

    I. Government leaders usually consider the public interest over special interests.
    II. Because of the median voter hypothesis, there is not much difference in the views of candidates running for office.
    III. Most voters are well informed about candidates for office.

    a. I only
    b. II only
    c. III only
    d. II and III only
    e. I, II, and III

20. Which of the following is the best example of a tax based on the ability-to-pay theory of taxation?
    a. Sales tax
    b. Property tax
    c. Excise tax on gasoline
    d. Federal income tax
    e. Highway tolls

21. In what tax is the benefits-received principle of taxation most evident?
    a. Corporation income tax
    b. Personal income tax
    c. Excise tax on gasoline
    d. Inheritance taxes
    e. Progressive tax rates

22. Which of the following taxes is considered regressive?
    a. Sales tax
    b. Personal income tax
    c. Corporation income tax
    d. Federal estate tax
    e. None of these taxes is considered regressive.

23. Which combination of elasticities of supply and demand will result in the excise tax being most easily shifted to consumers?

	Demand	Supply
a.	Elastic	Elastic
b.	Inelastic	Inelastic
c.	Elastic	Inelastic
d.	Inelastic	Elastic
e.	Perfectly elastic	Perfectly inelastic

24. An excise tax will generate the most revenue for government if:
    a. Demand is inelastic.
    b. Supply is inelastic.
    c. Demand is elastic.
    d. Supply is perfectly elastic.
    e. Demand is unit elastic.

25. "The President's proposed increase in the federal tax on gasoline is intended to reduce the amount of gasoline purchased and raise more revenue." The second goal would be best served (and the first goal least served) if the demand for gasoline is which of the following?
    a. Unit elastic
    b. Relatively elastic
    c. Relatively inelastic
    d. Perfectly inelastic
    e. Decreased by the tax

Sample Short Essay Questions

1. Is elementary and secondary education a public good? Evaluate education by the criteria of a public good.

2. Use a supply and demand graph to illustrate a negative externality. Explain your graph.

3. Use a supply and demand graph to illustrate a positive externality. Explain your graph.

4. "I believe excise taxes are the best type of tax because businesses and not consumers pay them." Does this statement reflect sound economic thinking? Why or why not?

*5. The city council in Portland, Oregon, must decide on a tax increase to finance a new airport. What advice would you give if you believed in the benefits-received theory of taxation? What advice would you give if you believed in the ability-to-pay theory?

6. How could you change a six percent sales tax on all purchases to make it less regressive?

*Question 5 developed by Gregory Breuner, Lakeridge High School, Lake Oswego, OR, and Mary Jo Thomas, South Eugene High School, Eugene, OR.

Sample Long Essay Questions

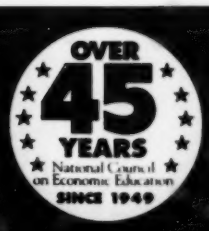
*1. One approach to the problem of pollution control in a market economy is the selling of pollution "credits" known also as "externality rights." The pollution control agency of Big Falls has determined that 500 tons of pollutants may be discharged into the Fox River each year because that is the determined recycling capacity of this particular river. Accordingly, 500 pollution credits entitling the owners to dump one ton of pollutants into the river in a year are available. The city intends to make 500 pollution credits available each year.
   a. What would be the shape of the supply curve for pollution credits in 1995? Why?
   b. What would be the shape of the supply curve for pollution credits in 2000? Why?
   c. Draw and label the demand curve for pollution credits in 1995. Why would it assume that shape?
   d. Draw and label the demand curve for pollution credits in 2000. Explain what would happen to the demand over time.
   e. What would happen to the equilibrium price for pollution credits over time? Why?
   f. What are the costs and benefits of this approach to pollution control for producers, consumers, and the public?

2. Assume that the government places a 100 percent tax on Greebes. Neither the demand for Greebes nor the supply of Greebes is perfectly inelastic or perfectly elastic. With the use of graphs, explain what will determine the incidence of this tax on Greebes.

3. Henry George believed that there should be a single tax on land. This tax would be paid by the landowner and could not be shifted to the consumer. Given Henry George's assumption that the supply of land is fixed, was he right or wrong? Illustrate this on a graph.

4. What is the difference between the ability-to-pay theory of taxation and the benefits-received theory? Give an example of a tax that meets the criteria of the ability-to-pay theory and a tax that meets the criteria of the benefits-received theory.

*Question 1 developed by Gregory Breuner, Lakeridge High School, Lake Oswego, OR, and Mary Jo Thomas, South Eugene High School, Eugene, OR.



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